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"Success Produces Confidence, Confidence Relaxes Industry, and Negligence Ruins That Reputation Which Accuracy Has Raised."
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Vol. XIX, No. 12 DECEMBER, 1930

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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Published Monthly by the American Pharmaceutical Association: Office of publication, 20th & Northampton Sts., Easton, Pa. Editorial Office, 10 West Chase St., Baltimore, Md.

Annual Subscription, $4.00; Single Numbers, 35 Cents.

THE 79th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN MIAMI, FLA., DURING WEEK OF JULY 28th. HEADQUARTERS, COLUMBUS HOTEL. LOCAL SECRETARY, G. H. GROMMET, 2364 S.W. 11th ST., MIAMI.

The 1931 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries and of Pharmaceutical Law Enforcement Officials will also be held at Miami, same time and place. The Plant Science Seminar will be held at Gainesville, Fla., during the week of July 21st.

Entered as second-class Matter, January 23, 1917, at the Post Office at Easton, Pa., under the Act of March 3, 1879.
Acceptance for mailing at special rate of postage provided for in section 1103. Act of October 3, 1917; authorized July 10, 1918.

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May Your Christmas Be Merry and Joyful and 1931 a Happy and Prosperous Year.

THE celebration of Anniversaries recalls the history of the times of their inception, brings us into touch with the active participants in the event or the discovery being memoralized and interprets the facts relating thereto.

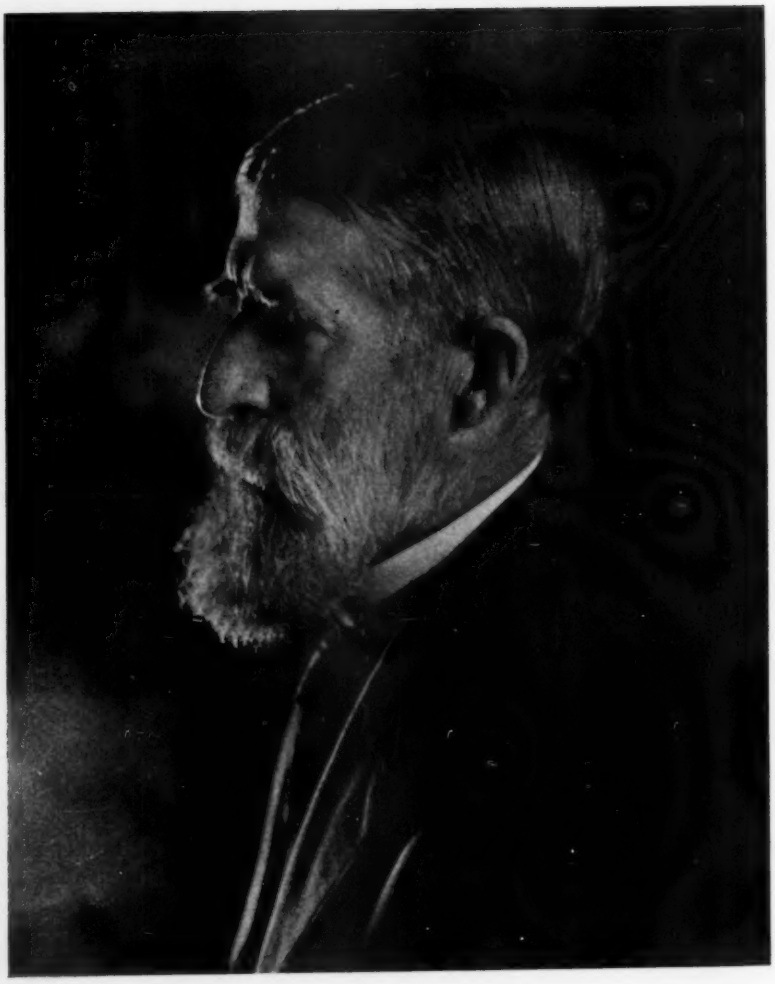
SOME time ago the writer paraphrased the words of another in the following prayer, so as to make it applicable to pharmacy and pharmacists—"Give me a due and decent esteem of my profession and of myself, that I may regard no man's occupation higher than mine, envying none so long as I serve honorably the sick and the injured."

This is the opportune time for pharmacists to evidence their loyality to and support of Associations and, by example, their belief in one another and in coöperation.

EVERYWHERE pharmacists, druggists and manufacturers contribute, as they should, to the advancement of their home cities and institutions and by large gifts and provisions in their wills give to worthy causes; in some of which the memorial which they sought to perpetuate becomes hidden and neglected. The American Institute of Pharmacy should have a large endowment for its activities. Here, those who have acquired wealth in the drug industry have opportunities for memorials, expressive of their appreciation and valuation of pharmacy, and those whose means are more modest can have a share in the great undertaking in which their names, or those they desire to memorialize, will be placed on record with others who have shared in the development of American Pharmacy.—*The foregoing embodies a Christmas wish.*

STOCK-TAKING, at the end of a year not only determines the condition of a business but indicates how existing defects may be corrected, what may be added or advantageously cut out of the stock—how the stock may be simplified or augmented to produce greater profit or render better service. So, also, unsatisfactory general conditions point out to the observant the way of correcting them by emphasizing those activities of the business or professional life of pharmacy in which the owner is most interested and for which he is best qualified—above all, however, the fullest measure of success is possible only when *all the divisions of pharmacy and the drug-trade activities* are united in their common interests and are convinced that coördinated coöperation strengthens a cause and indifference hinders or makes success more difficult.—*A New Year hope on which to base your resolve.*

THE AMERICAN INSTITUTE OF PHARMACY.



ELIE H. LA PIERRE.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XIX DECEMBER, 1930 No. 12

ELIE HENRY LA PIERRE.

HONORARY PRESIDENT, A. PH. A., 1930–1931.

Elie H. La Pierre was born in Wolcottville, now Torrington, Connecticut, of Canadian-American parents. Soon after his birth the family moved to Burlington, Vermont, where they resided for some years. After the father's death the family removed to Cambridge, Massachusetts, where Professor La Pierre has since resided.

After serving his apprenticeship in pharmacy with J. Ward Hill, a druggist of Cambridge, the young La Pierre entered the Massachusetts College of Pharmacy, from which he was graduated with the Class of 1880. After graduation he continued to work for the firm of Bayley and Richardson, successors to Mr. Hill, for about seven years, and then purchased the store from Mr. Bayley, who had bought out Mr. Richardson, and in 1893 moved it to 80 River Street where it has remained ever since. He has served the community as employee and owner of this store for about sixty years. In 1909 the La Pierre Drug Company was incorporated and at one time it owned five neighborhood stores in Cambridge and Boston, but two of these have been sold in recent years.

In 1882 Professor La Pierre became a member of the Corporation of the Massachusetts College of Pharmacy, and he has served the College devotedly since that time: as Trustee, 1888–1892; Instructor in Materia Medica and Botany, 1892–1896; and Professor of Pharmacy, 1896 to the present time. He has also served a term as president of the Alumni Association and has been auditor of that organization for many years.

He has been a member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1892 and he served on the Council and on the Committee on Finance for several years. He was president of the Massachusetts State Pharmaceutical Association, 1904–1905, and was vice-president of the American Conference of Pharmaceutical Faculties, 1909–1910, acting as President at the Richmond meeting in 1910 because of the death of the president, William H. Searby.

Professor La Pierre has long been active in civic affairs in his home city, having served for many years on the Cambridge Board of Health, as a Trustee of the Cambridge Hospital, and in other ways.

Always a hard worker, with a genial and sympathetic nature, and a rare devotion to the Massachusetts College of Pharmacy and its students, Professor La Pierre has the admiration and affection of his associates and students to an unusual degree. Mrs. La Pierre has been his constant companion and is well known to members of pharmaceutical organizations whose meetings they have attended together. They have two married daughters and several grandchildren.

With all his varied activities, Professor La Pierre has remained a professional pharmacist of the highest type, and has earned a prominent place in the long line of workers for the best interests of pharmacy in New England.—T. J. BRADLEY.

FLUECKIGERIANA.

BY EDWARD KREMERS.

V. Flueckiger letters to Power, 1882–1890.*

Baden-Baden, Oct. 23, 1884.

MY DEAR FRIEND:

I have to thank you for your interesting papers on "hydrastine" (1) and the "Development of Chemistry" (2) which came duly to hand as well as, several months ago, your letter of the 20th May. In the letter you mentioned the possibility of an english, or more correctly american edition of my "Pharmaceutische Chemie" (3). I must apologize for not having yet replied, but may state now, that such a prospect would be very agreeable to me—provided you can save so much time. I am engaged in the work, but very slowly progressing, so that the new edition, in all probability, will be printed not before the year 1886. I am no longer able to work as fast as I would like to do and the book must be thoroughly and carefully revised. I shall inform you in due time when I shall be nearly ready to go to press.

. . . . . .

As to your translation of the "Chinariden" I see that it is now appreciated in the leading english medical journals, as for instance in the Lancet. I am pleased also to see that your great analytical work which you published jointly with Dr. Hoffmann (4), is a splendid success.

I am here (5) using hot air baths and a medical treatment for hoping to get rid of severe rheumatic pains: I had a very sharp attack a fortnight ago. At the same time I am avoiding the noisy festivities at Strassburg where they are about to inaugurate the new University building (6), which are indeed most splendid.

Dr. Meyer is still my assistant, no better employment having made its appearance although he has already published several excellent pamphlets (7).

My wife joins in kindest regards, believe me to remain

Yours very truly,

F. A. FLUECKIGER.

(1) "Hydrastine." A paper read at the Milwaukee meeting of the A. PH. A., August 28, 1884 and published in the PROC. A. PH. A. (1884), page 448; also in the *Pharm. Rundschau*, 2, page 212.

(2) "The Development of Chemistry and Its Relation to Pharmacy." An address delivered before the second Madison meeting of the Wisconsin Pharmaceutical Association, August 6, 1884. *Proc. W. P. A.* (1884), page 49. Also published in *The Druggist*, vol. 6, page 199.

(3) Flueckiger's *Pharmaceutische Chemie* made its first appearance in 1879.

(4) A manual of chemical analysis by Fr. Hoffmann and F. B. Power. Published in 1883 by Henry C. Lea's Son & Co. of Philadelphia.

(5) Baden-Baden as becomes apparent from the date. This was at the beginning of the fall semester. Hence the indisposition must have been rather serious, otherwise Professor Flueckiger would not have left his institute and also missed the festivities referred to in the next sentence.

(6) In his The Kaiser Wilhelm's University of Strassburg, Dr. Power, in 1897, gave "A Brief Historical Sketch of Its Development and the Celebration of Its Twenty-Fifth Anniversary." *Pharm. Review*, 15, page 127. Dr. Power was at that time Director of the Wellcome Chemical Research Laboratory in London and had made the trip to Strassburg to attend the celebration.

(7) See footnotes 7 and 8 of the previous installment. THIS JOURNAL, page 1132.

* Continued from page 1132, October JOURNAL A. PH. A., 1930.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase Street, BALTIMORE, MD.

THE IMPORTANCE OF KNOWLEDGE AND EXPERIENCE IN THE SALE AND DISPENSING OF MEDICINES.

"HUMAN experience, like the stern lights of a ship at sea, too often illuminates only the path we have passed over."—Coleridge.

The quotation is applicable to unfortunate experiences in the dispensing of drugs—time after time mistakes, which have cost human life and suffering, are brought to the attention of the public; for the moment there are questionings of why these happenings and no correction of the system which permits of the handling of drugs by those not qualified by education and training.

Seemingly, selfish and "commercial" motives make some of these conditions possible. Certainly, no hospitals should permit the dispensing of medicines by others than qualified pharmacists. A recent unfortunate occurrence emphasizes that even in the handling of what are known as household remedies there is danger. The public should be impressed with these facts by information in the public press and insist on proper regulations. Accounts of the poisonings are read as news items and forgotten, except by those who suffer from the experience. We quote from the December *Southern Pharmaceutical Journal:*

"A well-known mail order house in Texas which made the mistake of dispensing medicine instead of leaving that to the legitimate channels of the drug business is now writhing under the threat of immense damage suits and the menace of still larger damage suits unless 18 five-pound packages labeled epsom salts but containing oxalic acid crystals can be recovered before they are used. The colored man who put up these salts probably couldn't read, so he couldn't be blamed for packaging what looked like epsom salts, but the house which hired an incompetent to package medicine is guilty of the crime."

Among the results of the error several injuries are mentioned: A woman, whose intention was to take a magnesium sulphate bath, suffered serious injury from the oxalic acid solution; a man who required the action of a saline has been temporarily, if not permanently injured by an overdose of the poison. These cases have become known through damage suits and others may follow.

Not so very long ago a half pound of powdered mercuric chloride was sent out for a half pound of bulk calomel; as a result, before discovery, the patient was seriously injured.

When will the state and federal authorities take cognizance of these sources of danger and insist that drugs be dispensed in hospitals by trained pharmacists and sold only by qualified pharmacists? A qualification of every hospital should be "that a pharmacist is in charge of its pharmacy." No one should be permitted to sell drugs who is not registered under the State pharmacy law. Dereliction along these lines seems to warrant the statement that selfish and "commercial" motives interfere with insistence or proper provisions for the sale and dispensing of medicines.

Want of education and training subjects the people to the effects of chance.

COÖPERATION BETWEEN PHYSICIANS AND PHARMACISTS.

DR. MORRIS FISHBEIN, editor of the *Journal of the American Medical Association*, in an article in the *Chicago Retail Druggsts' Association News*, on the coöperation between physicians and pharmacists, states the following:

"When James Percival wrote his Principles of Ethics for the medical profession in 1803, a special section was devoted to the importance of proper coöperation between physician and pharmacist. The recognition of definite brotherhood between the professions has existed since the beginning of medical history. Galen, whose doctrines governed medical practice for more than twelve hundred years, began with a pharmacist shop near the Forum in Rome. From his day to ours both professions have made tremendous strides. The modern pharmacist must be a well-educated man with special knowledge of chemistry and biology, as well as of compounding of drugs and their preparations. The armamentarium of therapeusis includes substances so potent that dosages are measured in millionths of grams or cc. and products so delicate that their preservation demands large and costly equipment. The physician thoroughly trained in therapeutics must depend on the pharmacist to provide what he desires for the patients promptly and efficiently. The promotion of scientific prescribing and dispensing will increase confidence in medicine and in pharmacy and is unquestionably the best method of attacking pseudo-scientific and fanatical cultists who oppose medical progress."

We repeat what has been stated before in these columns: the reason for the existence of pharmacy is the practical service to man. All of this service is not rendered directly to the patient, but largely by direction of the physician. It is a service of supplying medicine in most effective form, using due care in the preparation, thereby protecting the physician as well as the patient, hence both are concerned in the pharmacy and in the qualifications of the pharmacist, to uphold the standards and restrict the preparation and sale of medicines to those properly trained and who, therefore, realize their responsibility. This constitutes protection and who will say that one is less important than the other in the preservation of life and health.

Realization of responsibility comes with proper pharmaceutical training and education. Members of related professions acquaint the public, in a dignified way, with the importance of their professions; this has been pointed to by leaders, and rightly so, as a service. There is no reason why pharmacists should not do likewise; greater pride in the profession will contribute to its service.

STUDY OF DRUG STORE MERCHANDISING AND SURVEYS OF PHARMACY.

IN THE July number 1930 of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, an editorial report was made of the contemplated survey and study of distribution through drug store channels. The plan for this work is being developed and it has been definitely agreed to begin on January first and continue for one year a fact-finding study of drug store merchandising. Ten

drug stores, including two chain stores in St. Louis, and a country store, will serve as laboratories for this study which will have a national application.

More than thirty national associations representing industries using drug stores as retail outlets are sponsoring the study through the National Committee. The officers are: *Chairman*, Robert L. Lund, St. Louis; *Vice-Chairman*, R. E. L. Williamson, Baltimore; *Treasurer*, J. H. Riemenschneider, Chicago; and *Executive Secretary*, J. A. Troy, of the St. Louis Chamber of Commerce. The National Committee is working with a Local Ways and Means Committee composed of St. Louis business men representing all branches of the drug trade.

Wroe F. Alderson, chief business specialist from the U. S. Department of Commerce, who delivered an address before the Baltimore meeting of the A. PH. A., has, in coöperation with the National Drug Store Survey Committee, prepared a comprehensive survey plan, and his report has been used in preparing this comment. He has set forth the following as some of the interesting questions on which the survey is expected to shed some definite light:

"Which departments are showing a profit? Which soda fountain items are of outstanding value and which could be dropped without loss in sales or profit? Which is the value of certain staple items of business getters in relation to other products? How can turnover be increased on commodities carrying a considerable investment? How can the merchant determine how low a markdown he can afford? How can the cost of purchase transactions to both retailer and wholesaler be lowered? In what ways can general overhead expenses be cut down? What departmental line-up yields best results in total sales and operating costs? What are some of the avoidable causes of failure among retail druggists?"

It will be noted that the survey is designed to provide correlated information about the merchandising operations of retail drug stores; to show costs and profits for all commodities handled in a representative group of stores, to investigate the conditions of profitable and unprofitable operations in each instance; to develop and test merchandising and control methods in the stores studied and ultimately to furnish the basis for improved distribution of drug store commodities throughout the country.

The Department of Commerce will publish the principal reports and use its entire organization of commodity divisions and field offices coöperating with the industry in bringing the results of the survey to the attention of the drug trade throughout the United States. It will also disseminate information through the medium of the press, circulars and radio addresses.

The estimated cost of the survey is about $100,000; half of this amount will be contributed by the industries represented and the other half by the Department of Commerce through its service.

American business has been aided liberally by the Government in scientific research and it is just as necessary that it now coöperate with industry in assisting research leading to the solution of our complex distribution of problems. The survey may be considered as a definite contribution to that end.

Plans are progressing for making a survey which will be helpful in revising the U. S. Pharmacopœia and National Formulary, so that these standards will be of the greatest service and its aims and purposes more generally understood. As a result of these studies standards of greater service will result.

Commenting further on the preceding: The progress of the drug-trade activities depends on adequate education so as to make pharmacy a growing service for the health of the people, the regulation of its trade practices, reasonable observation of its codes of business and professional ethics and on bringing all of its divisions into active coöperation.

THE CHEMISTRY OF CINCHONA, HISTORICALLY CONSIDERED.*

CINCHONA became an item of European materia medica fully a hundred years after the iatrochemical school of medicine had been founded by Paracelsus. If the physician was slow in adopting the new ideal of the medical rena ssance, the apothecary was equally slow in putting the chemical changes proposed by the reformer of chemistry and medicine into practice. For a long time, therefore, cinchona bark was administered in powdered form—mortar and pestle are even to-day regarded as the symbols of the apothecary: the "Powder of the Countess" after the Countess of Chinchon, for whom the bark was named; "Jesuit's Powder," because the members of this order are said to have distributed it widely; and, finally, "Cardinal's Powder," because the Jesuits are reported to have sent a lot of this "new remedy" to an Italian cardinal.

Somewhat later, the tincture and the extract were employed. The modern pharmacist generally looks upon these two classes of preparations as galenicals, yet they were not used by the galenists of the old school, but were introduced by the iatrochemists. Extraction, like distillation, was regarded as a distinctly chemical operation. As late as the beginning of the nineteenth century, the amount of "resinous" extractive was looked upon as a means of determining the therapeutic value of the drug. It was, indeed, the precursor to our modern assay for total alkaloids.

The situation was changed almost over night when, in 1820, Pelletier and Caventou, two Parisian pharmacists, isolated quinine and cinchonine from the "quina" or cinchona bark. This was three years after Sertuerner, a German apothecary, had demonstrated the basic, salt-forming properties of morphine, a discovery that was supposed to place organic chemistry on a rational basis and incidentally paved the way for the discovery of quinine and a host of other alkaloids of greatest importance to medicine and hence to pharmacy. What seems even more remarkable is the fact that this "new remedy" rapidly found its way, not only into European materia medica, as is evidenced by the various editions and translations of Magendie, "Formulaire de Nouvelles Medicaments," but that its use spread with remarkable rapidity to the remotest territories of this union as they were first opened up to settlement by the whites. An interesting story is told of one of the first physicians of Milwaukee who dispensed quinine for calomel as a remedy against fever and ague and who was much concerned when he discovered his mistake. To his great relief the patient reappeared the next day hale and hearty. Before the close of the first quarter of a century after its discovery, a Milwaukee druggist advertised the receipt of a shipment of two hundred ounces of French quinine sulphate.

* Abstract of an address by Edward Kremers, at the 300th anniversary celebration of the first authentic record of the use of Cinchona. The celebration was held at Missouri Botanical Garden, October 31st and November 1st.

But the discovery of quinine, important therapeutically as that was, marked but the beginning of the chemical researches conducted in connection with this drug, a most valuable contribution by South American Indians to our European and American materia medica. Thanks to the manufacture of quinine on a large scale, also thanks to the purity standards demanded by the several pharmacopœias of civilized countries, the by-products which accumulated became the objects of further research. To-day more than twenty alkaloids are known to exist in cinchona barks and the barks of related genera of trees. Some of these have been used as specifics in modern medical practice.

Important as is the therapeutic application of these alkaloids, they constitute no large percentage of the drug, about four to seven per cent.[1] They are assumed to be combined in the drug with a tannic acid known as cinchotannic acid. This substance, in turn, is supposed to give rise to a so-called phlobaphene, the cinchona red, a representative of a class of plant constituents about which we know even less than about the tannins. The tannic acid of the tree is also supposed to be combined with a sugar in the form of a glucoside, hence we may have such a complex molecule as an alkaloid-tanno-glucoside. Related to the sugar, and of special interest to the biochemist is the quinic acid. The common plant constituents, such as starch and cellulose, need only be mentioned, but can otherwise be ignored in this connection, for they have no specific significance so far as cinchona is concerned.

Finally, a chemical substance should be mentioned, which, though not contained in cinchona as such, has been obtained from quinine by destructive chemical action, quinoline, a base related to pyridine on the one hand and benzene on the other. Its significance lies not only in the fact that it has assisted the organic chemist in determining the structure of quinine and related alkaloid molecules, but in that it has given rise to a chemical definition for alkaloids; an unfortunate one, it is true, but one that has played an important rôle in the history of the chemistry of the alkaloids as a class.

COMMISSIONS FOR PHARMACISTS.

THE FOLLOWING commissions as Assistant Pharmacists, in the U. S. Public Health Service, were confirmed by the Senate on December 10th: Edgar B. Scott, Edwin M. Holt, William L. Stearns, Frank L. Gibson, Newton C. Comfort, Carl Stier, Clarence H. Bierman, Walter H. Keen, Raymond D. Kinsey, Thomas C. Armstrong. These are the first commissoned pharmacists under the Parker Bill, now a law, by which pharmacists are placed on the same basis as to appointment, pay, promotion, disability privileges, etc., as for medical officers; the rank of the above-named corresponds to that of *First Lieutenant.*

[1] This statement was taken from Tschirch, "Handbuch der Pharmacognosie." According to the Dutch cinchona expert who reported on the cultivation of cinchona trees in Java, the percentage has been greatly increased.

The 79th Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Miami, Fla., during the week of July 28th, 1931.

SCIENTIFIC SECTION

THE QUALITY OF ACONITE.

BY H. B. HAAG AND L. W. HAWKINS.

About fifteen or more years ago a series of articles appeared from this and other laboratories bearing upon the variability in physiological activity of the then available supply of aconite preparations. That the physiological potency of one specimen might be seven times that of another was shown by Haskell (1), and his co-workers (2, 3, 4), although all of the preparations in a series might assay practically within the official chemical requirements of the Pharmacopœia then in force. Similar findings were characteristic of most of the papers concerned with the subject (5, 6). Because the majority of investigators found the chemical method of assay to be an unreliable index as to physiological activity, this procedure was discarded in the tenth revision of the United States Pharmacopœia in favor of the bio-assay test, employing guinea-pigs. The value of this method of standardizing aconite has been quite definitely established by several groups of workers (7, 8, 9, 10, 11).

It has been known for some time that aconitine, by far the most active principle in aconite, is rather unstable, and it has also been shown that preparations of aconite, unless prepared in acidulated media, readily undergo deterioration (12, 13, 14, 15). However, reasoning on the basis that adoption of the guinea-pig method of assay renders standardization of aconite more accurate, the impression is held in some quarters that the activity of the tincture now on the market is probably more uniform than it was when the preparation was assayed according to its aconitine content, as outlined by earlier pharmacopœias.

During the course of another investigation our attention was called to the great variation in activity which existed between two specimens of tincture of aconite submitted to this laboratory for examination. Hence, it was thought that it might prove of interest to compare the quality of the tinctures of aconite now available for clinical use with that of preparations examined in this laboratory when the U. S. P. VIII was in force; and, in light of the recent work of Swanson, *et al.* (12, 13, 14), with special reference to the hydrogen-ion concentration of the various tinctures.

Four specimens of tincture of aconite manufactured under the names of well-known pharmaceutical houses were obtained from local jobbers. It is interesting to note that, although the present Pharmacopœia has been official for over four years, the product of one prominent manufacturer bore a label stating that the drug had been standardized chemically. This is possibly explained upon the assumption that the local dealer had not renewed his supply for quite some time; nevertheless this is an indication of laxness from some source. This is to be deplored, not that it is particularly important in the case of the almost therapeutically ostracized aconite, but because the same indifference might be employed with other much more important drugs, such as digitalis preparations, which are liable to deterioration. It might be stated at this point that this particular preparation showed the lowest activity of any tested. A fifth specimen was obtained

from the Practice Drug Store of the School of Pharmacy of this institution, and although it had been presented as a museum specimen, and hence probably not intended for clinical use, it was far more active than the one mentioned above, which was being offered for distribution to the dispensing pharmacists. Because of the inability to obtain a specimen of tincture of aconite manufactured by one of the larger pharmaceutical houses from local jobbers, the sixth specimen was obtained directly from the manufacturer (listed as specimen number one in tables).

The assays were made upon guinea-pigs as directed by the U. S. P. X, the M. L. D. being taken as the smallest amount, injected subcutaneously, which would cause death in two out of three guinea-pigs in six hours. The following table illustrates the results obtained:

TABLE I.

Specimen number.	M. L. D. (cc. × Gm. bodyweight).	Per cent below minimal U. S. P. requirements.
1.	0.00045	0.0
2.	0.00045	0.0
3.	0.0005	10.0
4.	0.0006	25.0
5.	0.00075	40.0
6. plus	0.0045 plus	90.0

The label on specimen number three bore the statement that the minimal lethal dose (M. L. D.) was 0.0004 cc. × Gm. bodyweight (which is the mean between the upper and lower limits of the Pharmacopœia), that on number one and four stated that to overcome deterioration, acid had been added, number five was the museum specimen, while number six was the one bearing the lable indicating that it had been standardized upon its aconitine content. Judging from the statement on the labels, the alcoholic content was about the same for all of the specimens. Inasmuch as number five was a museum specimen and consequently never would have been offered for dispensing, this tincture should not be considered so seriously as the others. The criticism might be raised that whereas number six was probably prepared prior to the present pharmacopœial requirements, it should likewise not be considered in this analysis. However, we were concerned with the supply of aconite which was being offered to pharmacists for use by them in prescription work, and there is no doubt but that this was being sold to these dispensers. Whereas guinea-pigs tolerated well ten times the maximum U. S. P. dose no further attempt was made to determine the exact toxicity of number six; this would have required evaporation of the tincture, thus bringing in questionable factors. The table shows that of the preparations only two assayed, and then only barely, within the pharmacopœial requirements, which state that the M. L. D. should be between 0.00035 and 0.00045 cc. of the tincture per Gm. bodyweight when tested upon guinea-pigs. This is no indictment against the guinea-pig method of assay, but rather shows that (*a*) proper procedures should be utilized to stabilize the preparation, and (*b*) manufacturers should see to it that their agents exercise more judgment in the care of their stocks to the end that the products offered for sale be of sufficiently recent manufacture to indicate that when made at least, they conformed to the latest revision of the pharmacopœia.

In a paper having the same title as the present one, Haskell in 1916 (1) included

the following table which gives an index to the quality of the preparations then on the market. For purposes of comparison the results of the present investigation are also tabulated again. Identical numbers in each of the series do not necessarily indicate that the tinctures were obtained from the same sources.

TABLE II.

1916. Specimen number.	M. L. D. (cc. × Gm. bodyweight).	1929–1930. Specimen number.	M. L. D. (cc. × Gm. bodyweight).
1.	0.00033	1.	0.00045
2.	0.00065	2.	0.00045
3.	0.00065	3.	0.0005
4.	0.00150	4.	0.0006
5.	0.00240	5.	0.00075
6.	0.00240	6.	plus 0.00450

While the average activity of the specimens available in 1929–1930 is somewhat greater than that of the 1915 specimens, the range of variation is even greater than in the older series. Omitting the last two specimens in the 1929–1930 table, the average then obtained is somewhat encouraging, although even then the figure is below the U. S. P. minimum requirements.

The publications of Swanson and others (12, 13, 14) clearly indicate that deterioration of aconite preparations depends upon acidity of the finished product. Tinctures prepared with an acidulated menstruum are stable, and those acidulated after ordinary manufacture show much less deterioration than those prepared according to the U. S. P. X. It has also been demonstrated that for preparing a stable tincture or fluidextract of aconite the finished product should have an acidity corresponding to a p_H value of from 2.5 to 3.0. This led us to examine the hydrogen-ion concentration of the samples which we had tested biologically. In determining this, the quinhydrone method was employed, the tincture being diluted with an equal volume of double-distilled water which had been brought to boiling immediately prior to use. The determinations were made at room temperatures.

Table III gives the results, along with the table showing activity.

TABLE III.

Specimen number.	p_H.	M. L. D. (cc. × Gm. bodyweight).
1.	3.1	0.00045
2.	3.13	0.00045
3.	4.15	0.0005
4.	4.28	0.0006
5.	4.49	0.00075
6.	4.57	plus 0.00450

Lack of information as to the age of the various specimens detracts somewhat from the importance of these results. However, it is significant that those preparations having the greatest hydrogen-ion concentration also possessed the greatest physiological activity. Assuming that all were of approximately the same activity when manufactured, these findings emphasize the importance of Swanson's suggestion (14) that to insure stability, the product should have a numerical p_H value of not more than 3.00.

SUMMARY AND CONCLUSIONS.

1. From this study it appears that although the guinea-pig method of assay is now official, tinctures of aconite now offered for clinical use still show great variation in physiological activity.

2. There exists a close relationship between stability and hydrogen-ion concentration, as had previously been shown by Swanson. In view of this it would seem highly desirable that, if the preparation is to be retained in the Pharmacopœia, the product should be adjusted to the proper p_H as recommended by Swanson.

3. As in the case of all drugs subject to deterioration, a statement should be made on the labels of these preparations giving the date of manufacture and the time limit, if possible, beyond which the drug should not be used.

4. Inasmuch as it has been shown that digitalis leaf is far more stable than any of its liquid preparations (16) it would seem desirable that studies be made to ascertain whether the same holds true for aconite.

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THE HYDROLYSIS OF ARSENOUS IODIDE.*,**

BY WILLIAM J. HUSA.***

Reference books differ in their statements regarding the rate and extent of hydrolysis of arsenous iodide in aqueous solution. Hager's "Handbuch" (1) states that the aqueous solution is neutral, and that on long standing, or more rapidly on heating or in concentrated solution, hydriodic acid and arsenous acid appear in the solution. According to the U. S. P. (2), "one Gm. of arsenous iodide is soluble in about 12 cc. of water at 25° C. with partial decomposition" and "a freshly prepared aqueous solution of the salt is colorless, but upon standing, it

* Scientific Section, A. PH. A., Baltimore meeting, 1930.

** This investigation was aided by a grant from the AMERICAN PHARMACEUTICAL ASSOCIATION Research Fund.

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gradually decomposes with the formation of arsenous and hydriodic acids and becomes yellow due to the liberation of iodine." The British Pharmacopœia (3) indicates that "the aqueous solution is acid to litmus—."

In the present study, a search of the literature was made to find out what foundation there was for the statements quoted above, and experiments were carried out to determine the rate and extent of hydrolysis of arsenous iodide in aqueous solution.

HISTORICAL REVIEW.

At a meeting of the "*Société de Pharmacie de Paris*" in December 1827, A. Plisson reported (4) that arsenous iodide had been prepared by heating together the free elements in accordance with the directions of M. Henry, chef de la pharmacie centrale, for use as an external remedy by M. Biett, docteur médecin de l'hôpital Saint-Louis. On this occasion Plisson also gave directions for the preparation of the triiodide by the action of arsenic on iodine in the presence of water. He further reported that the solution of arsenous iodide was capable of dissolving mercuric iodide, thus antedating by 12 years the observation (5) of Dr. M. Donovan of Dublin.

For a year thereafter the meetings of the society were enlivened by a controversy regarding the nature of aqueous solutions of arsenous iodide. Sérullas and Hottot (6) pointed out that one would expect AsI_3 to hydrolyze in water as in the case of SbI_3, $SbCl_3$ and $AsCl_3$. They considered the solution of arsenous iodide in water as a mixture of hydriodic acid and arsenous oxide, citing as proofs the fact that the solution turned litmus red very strongly and that HI could be separated by distillation. Plisson (7) contended that the solution contained the elements of the iodide, not simply mixed in the state of the acid and the oxide, but well combined in the form of the iodide or "neutral hydriodide." One reason he gave in support of his views was that the solution had a yellowish color, and that it was thus not colorless as it would be if it represented only a mixture of the acid and oxide. After about a year of research and debate, the controversy was dropped, with both factions still fully confident of the correctness of their views.

Donovan (5), in 1839, evidently thought that water did not decompose arsenous iodide, since he considered that his solution of arsenous iodide and mercuric iodide contained a double iodide of arsenic and mercury. However, in the following year, Bette (8) observed that the aqueous solution of arsenous iodide showed an acid reaction. In 1859, Nicklès (9) reported that in contact with water, arsenous iodide decomposes into arsenous acid and hydriodic acid.

A few years later, the idea that the hydrolysis of arsenous iodide is a gradual process began to appear in reference books, although there seems to be no original work in the literature to support this view. The U. S. P. of 1870 (10) stated that the solution is gradually decomposed on standing, and that arsenous iodide is gradually decomposed by boiling water.

In 1881, Bamberger and Philipp (11) said that the solution undoubtedly contains hydriodic acid and arsenous acid. Since even Plisson (7) had recognized that the solution of arsenous iodide reddened litmus, and in view of the fact that all workers up to this point who mentioned the reaction of the solution had agreed that it was acid in reaction, it is difficult to see why some of the reference books

of this period began to include the statement that the solution is neutral in reaction. Thus in the "National Dispensatory" of 1884 (12) we find the statement that arsenous iodide "is soluble, with a neutral reaction and without decomposition, in water, alcohol, ether and carbon disulphide, but is gradually decomposed on being boiled with water or alcohol." The U. S. P. VIII stated that the solution is neutral to litmus paper and that it gradually decomposes on standing. According to the U. S. P. IX and U. S. P. X, arsenous iodide dissolves with partial decomposition, with further gradual decomposition on standing.

While the reference books were following the trends indicated above, the idea that arsenous iodide is practically completely hydrolyzed was expressed from time to time by various investigators, including Dott in 1893 (13), Dupouy in 1901 (14), Duncan in 1903 (15), Langenhan in 1925 (16) and Husa and Enz in 1929 (17).

However, during the one hundred years from 1828 to 1928, no real advance was made over the original observations and conclusions of Sérullas and Hottot (6). During this long period no exact quantitative measurements were made which would give an exact knowledge of the extent to which arsenous iodide is hydrolyzed in aqueous solution.

EXPERIMENTAL PART.

In the present investigation, it was planned to make accurate measurements of the p_H of solutions of arsenous iodide, by use of the quinhydrone electrode. While this work was in progress, an article was published by Cocking (18) in which data were presented on the point in question. According to Cocking "The hydrolysis of arsenous iodide in a freshly made dilute solution is almost complete, the reaction of an aqueous solution containing 1.52 per cent of the salt (approximately decinormal), being about p_H 1.1, that is, the same as that of a decinormal solution of hydriodic acid. Therefore it must be assumed that arsenous iodide dissolved in water is at once almost completely hydrolyzed into arsenious and hydriodic acids.

$$2AsI_3 + 3H_2O = As_2O_3 + 6HI.$$

The dissociation constants of arsenious acid

$$Ka\ 6 \times 10^{-10},\ Kb\ 1 \times 10^{-14}$$

being very small have no appreciable effect on the p_H of dilute solutions."

Although the excellent report of Cocking seemed fully acceptable, the work under way was continued with the idea of verifying the results and in order to determine whether any further change occurs on standing.

Measurements with Quinhydrone Electrode.—Cocking (18) has given no information as to his method of determining the p_H. In the present study, measurements were first made using the quinhydrone electrode. It was found that the addition of the quinhydrone caused an immediate liberation of free iodine, thus vitiating the results. Attempts to stabilize the solution by adding a few drops of hypophosphorous acid or 1 Gm. of dextrose to 35 cc. of solution proved unsuccessful. It was concluded that the quinhydrone electrode was not applicable to solutions containing hydriodic acid.

Measurements with Indicators.—As the solutions to be tested were clear and practically colorless, it seemed that indicator methods should give good results. Ac-

cordingly, determinations were made, using the La Motte block comparator and color standards, the indicators employed being acid cresol red and meta cresol purple. A solution of arsenous iodide containing 1.52 Gm. per 100 cc. was prepared. Ten minutes after mixing the ingredients a portion of the mixture was filtered while still slightly turbid. (When mixed with water the AsI_3 lost its brick-red color and became white, due to hydrolysis. The turbidity was due to undissolved As_2O_3 or basic salt.) The p_H of this solution was found to be 1.1. Half an hour after mixing the ingredients the solution was practically clear and showed a p_H of 1.1. After 3 hours the solution was entirely clear and the p_H was 1.1. Likewise after 1 day and after 25 days the p_H was still 1.1.

For the sake of completeness the p_H of $N/10$ HI as given by Cocking was verified. The HI (for the preparation of which I am indebted to Mr. Paul S. Shattuck) was made by passing H_2S into a mixture of iodine and water until the iodine was decolorized, filtering out the sulphur, and distilling *in vacuo*. By this method a pure, color'ess solution of HI was obtained, which was diluted to make a tenth-normal solution. The p_H was 1.1. The above results confirm the work of Cocking, and also show that there is no further change in p_H in 25 days.

Measurements on Donovan's Solution.—Donovan's Solution was prepared from two different lots of arsenous iodide, using the same kind of mercuric iodide in each case. One solution showed a p_H of 1.3 immediately after preparation, and after 1 day and 25 days the p_H was still 1.3. The other solution had a p_H of 1.2 immediately after preparation, and there was no change after 1 day and 25 days. With this particular lot of arsenous iodide there was practically no residue in the preparation of Donovan's solution, while with the other lot there was considerable residue to be removed by filtration. These results indicate that the p_H of Donovan's solution may vary slightly with the materials used, but after it is prepared there is no further change in the next 25 days.

DISCUSSION OF RESULTS.

The results indicate that a dilute aqueous solution of arsenous iodide is essentially a solution of arsenous acid and hydriodic acid, in equilibrium with a small proportion of arsenous iodide, the amount of the latter being necessarily comparatively small in view of the p_H.

It is clear that as a practical matter, time is not a factor in the hydrolysis, since even in freshly prepared solutions, equilibrium is reached in the few minutes necessary for the measurements to be made. The statement (1) that the aqueous solution is neutral is quite evidently erroneous.

In the next revision of the U. S. P. the statement regarding "partial decomposition" should be changed. Also since solutions of arsenous iodide have a characteristic pale yellowish color, and since free iodine will not appear until equilibrium has been reached in the following equation:

$$As(OH)_3 + I_2 + H_2O \rightleftarrows H_3AsO_4 + 2\,HI,$$

it is suggested that the U. S. P. XI monograph should read as follows:

"One Cm. of Arsenous Iodide is soluble in about 12 cc. of water at 25° C., with almost complete hydrolysis to arsenous and hydriodic acids. It is soluble in alcohol, chloroform, ether and carbon disulphide.

"A freshly prepared solution of the salt is colorless or pale yellowish; upon standing, after most of the arsenic has been oxidized to the pentavalent form, it becomes yellow due to the liberation of iodine."

SUMMARY.

1. A dilute aqueous solution of arsenous iodide is essentially a solution of arsenous acid and hydriodic acid, in equilibrium with a small proportion of arsenous iodide.

2. As a practical matter, time is not a factor in the hydrolysis at arsenous iodide, since in freshly prepared solutions equilibrium is reached within a few minutes.

3. Definite suggestions are presented as to necessary changes in the U. S. P. monograph.

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ABSTRACT OF DISCUSSION.

James C. Munch asked whether the author knew the percentage of arsenic and iodine in the solution, *i. e.*, Arsenous Iodide. The author replied this could be determined.

H. A. B. Dunning inquired whether there was a way of preventing hydrolysis. The author knew of no way of preventing it.

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This is a most acceptable time for pharmacists to evidence their loyalty to and support of the ASSOCIATION.

A STUDY OF MANDELIN'S TEST FOR STRYCHNINE.*

BY CHARLES F. POE AND DAVID W. O'DAY.

In general, many tests have been devised for the more common poisons. Strychnine, however, is an exception. There is practically but one class of color tests for strychnine. These tests depend upon the generation of oxygen in a concentrated sulphuric acid solution of the alkaloid. For the generation of oxygen one may use manganese dioxide, cerium oxide, lead peroxide, potassium dichromate, potassium ferrocyanide, ammonium vanadate, etc. When ammonium vanadate is dissolved in sulphuric acid, the test is termed Mandelin's test.

Since the chemical tests for strychnine are rather limited, and also since the test is very important in toxicology, it is extremely important that the limitations and the specificity of the test used for the detection of this alkaloid be well known. For the reasons given, it was decided to make a critical study of the color reactions for strychnine. The investigation to be reported in this paper deals with the detection of strychnine by means of Mandelin's reagent. When strychnine is treated with Mandelin's reagent a violet-blue coloration results, which soon changes to an orange-red, and finally to a yellow.

The experimental work has been carried out with the idea of determining the following points:

(1) Whether or not there are a large number of organic substances, other than strychnine, which will give the same reactions as strychnine with Mandelin's reagent.

(2) Whether the organic substances giving this test can be placed in any special groups, and whether the organic group or groups responsible for this test can be determined.

(3) Whether there are a large number of organic compounds which will interfere with the test and in what amounts they must be present for interference.

In selecting organic compounds for this study, an effort was made to include as many different groups and classes of organic compounds as were available. In the neighborhood of five hundred different organic compounds have been tested.

An ammonium vanadate-sulphuric acid solution, as a test for strychnine, was first proposed by Mandelin (1) in 1883. A few alkaloids besides strychnine will give color reactions with this reagent. According to Witthaus (2) the following alkaloids give strychnine-like reactions with this reagent: *1.* Curarin gives about the same play of colors, but the appearance is very much delayed. Curarin, however, is not extracted with organic solvents in alkaline solutions. *2.* Gelsemin produces a purple or red-violet color.

Self (3), in 1915, showed that yohimbine, an alkaloid obtained from the bark of *Corynanthe Johimbe*, gives the same purple with Mandelin's reagent as strychnine. However, upon dilution with water the purple color developed by strychnine changes to a beautiful rose-pink coloration, whereas with yohimbine no such color develops upon dilution.

Kundrat (4), in 1889, tested a number of alkaloids with Mandelin's reagent. He obtained distinctive colors with twenty-three of the common alkaloids. Besides with strychnine, he obtained a violet or violet-blue color with apomorphine and papaverin. We were able to confirm only a few of his tests, as will be discussed later on.

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* Scientific Section, A. PH. A., Rapid City meeting, 1929.

Efisio Mameli (5, 6), in 1911 and 1914, made a study of the influence of certain compounds employed in therapeutics on the Mandelin color reaction. He found a number of drugs which more or less interfered with the Mandelin color reaction. Mameli does not give the exact amounts of the drugs present as impurities. However, he concluded that, on the whole, the phenols, as well as the aromatic amines with their derivatives, show the greatest tendency to interfere with the characterization of strychnine by means of the Mandelin reaction.

Preparation of Mandelin's Reagent.—One part of finely ground ammonium vanadate was dissolved in 200 parts of cold chemically pure concentrated sulphuric acid.

Preparation of Standard Strychnine Solution.—A solution was prepared in alcohol containing one milligram per cubic centimeter.

Preparation of Solutions to Be Tested.—The compounds to be tested were dissolved in the proper solvent so that one cubic centimeter of the solution was equivalent to one mg. of the compound. Care was taken in selecting a suitable solvent which would both dissolve the compound readily and would volatilize on a water-bath. Substances which were relatively insoluble were finely ground and suspended in water or other solvents. The bottle was shaken before removing a portion of the contents to insure an even suspension of the substance to be tested.

Procedure of Test.—Three tests were made on each compound. For the first test one cubic centimeter of the solution to be tested was evaporated to dryness, and then tested with three or four drops of Mandelin's Reagent. If the color noted was yellow (the same color as Mandelin's Reagent), the test was termed "no reaction." In the second test one cubic centimeter of the solution to be tested and one cubic centimeter of standard strychnine solution were mixed and the test made as described above. If there was no interference, a blue-violet color resulted which soon changed to orange-red. If there was an interference in the color reaction, the colors resulting were recorded. The third test was carried out

TABLE I.—COLOR REACTIONS OBTAINED WHEN DIFFERENT ALKALOIDS WERE TESTED WITH MANDELIN'S REAGENT.

Alkaloid.	Authors' result.	Kundrat's result.	Alkaloid.	Authors' result.	Kundrat's result.
Aconitine	No	Cof'e-B	Nicotine	No	Darker
Apomorphine	Gr-bk to B-bk	V-bl to l bl	Physostigmine	No	G-Y carmine to Y-B
Atropine	No	R to Y			
Brucine	O-Y	Bl'd R	Pilocarpine	No	l O
Caffeine	No	No	Piperidine	No	
Cinchonine	No	O tur'ng gr'nish	Piperine	R-B	R-B to bk-B
Cinchonidine	No		Quinidine	Y to l G	bl-G
Cocaine	No	O	Quinine	No	O to bl-G
Codeine	Y to caramel	G to B	Sanguinarine	Gr'nish B to dk B	
Colchicine	G to gr'nish B	G to cof'e-B			
Emetine	Gr'nish B to B		Scopolamine	No	
Ergotine	No		Spartein	No	
beta-Eucaine	No		Solanine	Gr'nish B	
Homatropine	No		Theobromine	No	
Hydrastine	Red'sh B to B		Veratrine	B to red'sh B	B-R to R-V
Morphine	Gr-bk to B-bk	B			

Abbreviations: No reaction, No; B, brown; bk, black; O, orange; Y, yellow; G, green; Gr, grey; R, red; l, light; V, violet; bl, blue; P, pink; L, lavender.

as above except five cubic centimeters of the solution of the organic compound were used in place of one cubic centimeter.

A number of alkaloids were first tested with the reagent. These were of the highest purity that could be obtained on the market. The results are listed in Table I. There are also recorded the results of the tests as reported by Kundrat (4). It will be noted that in nearly every case this investigator obtained color reactions. A comparison with the results which the authors of this paper obtained show a great difference. The results of Kundrat may be accounted for by the probability of his having impure compounds.

In the pages immediately following, the results of the test with the organic compound alone will be given under the different groups of organic compounds. In order to conserve space the heading will be omitted after the first group. The name of the compound will be given, and immediately opposite will be given the color reactions. In cases where no color reactions were produced, the compounds will be listed with the statement: "*No color reaction.*"

AMINO ACIDS AND DERIVATIVES.

Organic substances.	Color reaction.
Diiodotyrosine	Greyish black
Glycyltryptophane	Traces of purple to yellowish brown
Leucine	Greenish yellow
para-Nitropheny glycine	Dirty lavender to brown
alpha-Phenylalanine	Greenish yellow to blue-green
Phenylglycine	Lavender to brown
Tyrosine	Dirty green to greyish black
Tryptophane	Traces of purple

No Color Reaction.—Acetylphenylglycine, alpha-alanine, para-aminophenylglycine, arginine, asparagine, aspartic acid, *d-l*-benzoyl-alanine, betaine hydrochloride, creatine, creatinine, edestine, ethylglycollate, glutamic acid, glycine, hippuric acid, iso-leucine, beta-phenyl-alanine, *d-l*-valine.

ALIPHATIC ACIDS.

No Color Reaction.—Aconitic acid, adipic acid, *d-l*-alpha-aminoacetylacetic acid, alpha-bromopropionic acid, beta-bromopropionic acid, formic acid, fumaric acid, lævulinic acid, maleic acid, malic acid—active 1, malonic acid, mesaconic acid, mucic acid, palmitic acid, stearic acid, succinic acid, tartaric acid, tartronic acid, trichloracetic acid.

ALIPHATIC ACID SALTS, ESTERS AND DERIVATIVES.

No Color Reaction.—Ethyl oxalate, ethyl succinate, iso-amyl propionate, iso-butyl acetate, iso-butyl iso-thiocyanate, methyl iso-thiocyanate, sodium formate, sodium oxalate, succinimide, thallous formate, thallous malonate, triacetin, tributryn.

ALIPHATIC ALCOHOLS AND DERIVATIVES.

No Color Reaction.—Cetyl alcohol, dulcitol, erythritol, ethylene glycol, iso-butyl alcohol, iso-propyl alcohol, mannitol, melissyl alcohol, octyl alcohol, trichlorbutyl alcohol.

ALIPHATIC, AROMATIC AND MIXED KETONES.

para-Amidoaceto-phenone	Dark brown
Benzalacetophenone	Greenish yellow
Tetramethyldiamido-benzophenone	Caramel to yellowish green

No Color Reaction.—Acetylacetone, benzal-acetone, benzophenone, methylacetophenone, methylheptenone, phorone.

MISCELLANEOUS ALIPHATIC COMPOUNDS.

Chitin	Brown
Oenanthol	Greenish yellow to brownish green

No Color Reaction.—Acetal, acetaldoxime, acetamide, acetoxime, aldehydeammonia, aminoguanidine bicarbonate, bromoform, chloral urethane, chloropicrine, dimethylglyoxime, guanidine hydrochloride, hexachloroethane, hexamethylenetetramine, iodoform, iso-butylbromide, iso-euginol, methylglyoxal, sodium bisulphite, monochlorhydrin, nitrosodiethylamine, oxamide, pinakon hydrate, propionamide, sulphonal, tertiary butyl bro-

mide, thialdine, tribromohydrin, trichloroacetyl chloride, trimethylene bromide, trional, veronal.

ANILINE AND ANILINE DERIVATIVES.

Benzanilide	Purple quickly changing to dirty light brown
para-Bromoacetanilide	Light caramel
para-Bromoaniline	Streaks of lavender to greyish brown
para-Nitroaniline	Light brown to red-brown
para-Nitrodimethyl-aniline	Yellowish brown
Nitrosodimethyl-aniline	Dark green

No Color Reaction.—Aniline, ortho-bromoaniline, meta-bromoaniline, ortho-chloroaniline, meta-chloroaniline, para-chloroaniline, *1-2-4*-dichloroaniline, *2-5*-dichloroaniline, *1-2-4*-dinitroaniline, exalgine, meta-nitroaniline, meta-nitrodimethylaniline, tribromoaniline, trinitroaniline.

AROMATIC ACIDS.

Acetylsalicylic acid	Greenish brown to green
Anisic acid	Greenish brown tinged with purple
Anthranilic acid	Yellowish green to brownish yellow
Arsanilic acid	Yellow to caramel
Benzilic acid	Purple to purplish red
Cinnamic acid	Yellow to brown tinged with lavender
Cumaric acid	Lavender to light brownish green
Diiodosalicylic acid	Yellowish green
Diphenylacetic acid	Blue-green to dark green
Gallic acid	Brown
5-Iodosalicylic acid	Light brown to caramel
Mandelic acid	Dark greenish brown to brown
Naphthionic acid	Greenish yellow to caramel
Phenylcinchoninic acid	Pinkish to brown
Salicylic acid	Light brown to yellowish green
Tannic acid	Pinkish brown to light brown

No Color Reaction.—Metanilic acid, terephthalic acid, ortho-toluic acid, para-toluic acid.

AROMATIC ACID DERIVATIVES.

No Color Reaction.—Benzamide, benzoic anhydride, cinchophen, cumarine, neocinchophen (ethyl-*6* methyl-*2* phenyl quinoline *4* carboxylate), nicotinic acid nitrate, meta-nitrobenzoyl chloride, paranitrobenzoyl chloride, phthalimide, ortho-tolunitrile, paratolunitrile.

AROMATIC ACID ESTERS.

Benzyl benzoate	Dark brown to brown-black
Phenyl salicylate	Yellowish green, blue-green to dark green

No Color Reaction.—Butyl benzoate, ethyl benzoate, ethyl salicylate, iso-amyl benzoate, iso-amyl salicylate, iso-butyl benzoate, methyl benzoate, methyl cinnamic ester, methyl salicylate.

AROMATIC ALDEHYDES, AROMATIC ETHERS AND MIXED ALCOHOLS.

Benzhydrol	Orange-red to brownish red
5-Nitrosalicylaldehyde	Dark green to blue-green
Piperonal	Yellow to greenish yellow
Salicylaldehyde methylether	Reddish purple to brown
Saligenin	Light purplish red to brown
para-Tolylaldehyde	Light purplish red quickly changing to yellow
Vanillin	Green-grey to grey-black

No Color Reaction.—Anisaldehyde, ortho-bromonitrobenzaldehyde, *1-2-5*-bromosalicylaldehyde, iso-phthalaldehyde, meta-methoxysalicylaldehyde, ortho-nitrobenzaldehyde, salicylaldehyde.

AROMATIC AMINES AND DERIVATIVES.

Acetyl-para-anisidine	Dirty greenish grey
Acetylphenetidin	Greenish brown
meta-Acetxylidine	Pinkish brown to grey
meta-Anisidine	Greenish brown to caramel
ortho-Anisidine	Greenish yellow with tinge of purple
ortho-Benztoluid	Reddish purple to dirty grey

para-Benztoluid	Old rose to pinkish brown
ortho-Phenetidine	Dirty bluish purple
para-Phenetidine	Brown with streaks of purplish blue
Phenyl-beta-diphenylamine	Brownish yellow to caramel

No Color Reaction.—Para-anisidine, *1-2-4*-xylidine, *1-3-4*-xylidine.

BENZENE AND TOLUENE DERIVATIVES.

Azoxybenzene	Greenish brown to reddish brown
Styrole	Greyish green

No Color Reaction.—Para-bromochlorobenzene, ortho-bromonitrobenzene, chloramine, metachloronitrobenzene, ortho-chloronitrobenzene, para-chloronitrobenzene, para-chlorotoluene, orthodichlorobenzene, *2-5*-dichloronitrobenzene, iodosobenzene, iso-propylbenzene, ortho-nitroacet-meta-xylidide, metanitrotoluene, ortho-nitrotoluene, para-nitrotoluene, mesitylene.

BENZOIC ACID DERIVATIVES.

No Color Reaction.—Meta-aminobenzoic acid, para-aminobenzoic acid, meta-bromobenzoic acid, ortho-bromobenzoic acid, parabromobenzoic acid, meta-chlorobenzoic acid, ortho-chlorobenzoic acid, para-chlorobenzoic acid, para-mercurichlorobenzoic acid, orthonitrobenzoic acid, meta-nitrobenzoic acid, para-nitrobenzoic acid.

CRESOL AND CRESOL DERIVATIVES.

5-Benzalamino-*2*-cresol	Greenish black to greyish black

No Color Reaction.—Meta-cresol, orthocresol, para-cresol, *3-5*-dibromo-ortho-cresol, tetrabromo-*o*-cresol.

GLUCOSIDES.

Aesculin	Purple to dirty brown
Amygdalin	Yellowish green
Arbutin	Brown with tinge of purple to brown-black
Salicin	Reddish violet to purple

HETEROCYCLIC COMPOUNDS.

Antipyrine	Dark blue-green to light green
Isatin	Brown

No Color Reaction.—Acridine, dimethylpyrone, furoic acid, *6*-nitroquinoline, oxyquinoline, quinaldine, skatole.

HYDROAROMATIC COMPOUNDS.

d-l-Camphor (natural)	Dark brown
Carvene	Light brownish yellow to brown

No Color Reaction.—*d*-Borneol, *d-l*-camphor (synthetic), camphoric acid, camphorsulphonic acid, carvenone, limonene, menthol, quercite, terpinol, terpinyl acetate.

NAPHTHALENE AND ANTHRACENE DERIVATIVES.

Acet-alpha-naphthalide	Grey-black
Acet-beta-naphthalide	Dirty green to greenish brown
Alizarin	Reddish purple to blood-red green
alpha-Naphthylamine	Dark green to bluish black
beta-Naphthylamine	Greenish brown to brown
alpha-Naphthylamine azobenzene	Purple and greenish black
beta-Naphthalene-sulphonic acid sodium salt	Grey-green to grey-black
beta-Naphthalene-sulphonic acid	Dark grey to grey-black
beta-Naphthol	Dark brownish green to brownish black
beta-Naphthylamine	Dark grey to brownish black
alpha-Naphthyl iso-cyanate	Green to dark green
Nitroso-beta-naphthol	Green to brownish green

No Color Reaction.—Alpha-bromonaphthalene, *1-5*-dinitronaphthalene, naphthalic anhydride, naphtholmethyl-alpha-ether.

PHENOLS AND PHENOL DERIVATIVES.

Acetyl-meta-aminophenol	Greenish brown to olive green
Acetyl-para-aminophenol	Dirty green to greenish brown
para-Aminophenol	Greenish blue to dark blue
para-Benzalaminophenol	Dirty grey-black

ortho-Chloromercuriphenol	Green to dark green
2-4-Dinitrophenol	Green to greenish yellow
meta-Nitrophenol	Dark blue-green to tan
para-Nitrophenol	Dark bluish green

No Color Reaction.—Anisol, ortho-bromanisol, para-bromanisol, para-bromophenol, ortho-chlorophenol, para-chlorophenol, *2-4*-dichlorophenol, *2-3*-dinitrophenol, *2-6*-dinitrophenol, para-nitroanisole, ortho-nitrophenol, phenetole, tribromophenol, trichlorophenol.

POLYHYDRIC PHENOLS AND OTHER PHENOL DERIVATIVES.

Benzoylthymol	Pinkish brown to dark brown
Carvacrol	Light brownish yellow to brown
Catechol	Green to dark green
Orcinol	Light caramel to brown
Phloroglucinol	Green to blue-green
Pyrogallic acid	Brownish black

No Color Reaction.—Dimethylhydroresorcinol, picric acid, thymol, xylenol.

SUGARS.

Rhamnose	Yellow to light blue-green

No Color Reaction.—Arabinose, galactose, glucose, lactose, levulose, *d*-mannose, melizitose, raffinose, sucrose, xylose.

THIOUREA AND THIOUREA DERIVATIVES.

Allyl thiourea	Greenish yellow
d-l-n-Butyl thiourea	Yellow to orange-pink
Diphenyl thiourea	Dark green to dirty grey-brown

No Color Reaction.—Thiourea.

TOLUIDINE AND TOLUIDINE DERIVATIVES.

Acetyl-ortho-toluidine	Light lavender-pink to dirty green
Acetyl-para-toluidine	Pink-lavender to dirty pink
Toluidine	Yellowish brown

No Color Reaction.—Acetyl-ortho-methyltoluidine, acetyl-para-methyltoluidine, *1-2-3*-nitrotoluidine, *1-2-4*-nitrotoluidine, *1-3-4*-nitrotoluidine, ortho-toluidine.

UREA DERIVATIVES, URIC ACID AND URIC ACID DERIVATIVES.

Ipral (calcium ethyl-isopropyl barbiturate)	Yellow to yellow-green
Peralga (amidopyrine diethyl barbiturate)	Brown to green
Phenylethylbarbituric acid	Yellow to light green
Thiobarbituric acid	Light blue-green
Uric acid	Greenish yellow

No Color Reaction.—Amytal (iso-amylethylbarbituric acid), acetylmethylurea, allantoin, alloxantin, barbital, barbituric acid, biuret, dibromobarbituric acid, guanine hydrochloride, urethane.

MISCELLANEOUS AROMATIC COMPOUNDS.

Allylphenylthiocarbamide	Light purple quickly changing to light grey
para-Amidazobenzene	Green to brown
Benzil	Green
Benzoin	Brown to dark green
Benzylphenylhydrazine hydrochloride	Streaks of pinkish lavender to yellow
2-4-Dinitrophenylhydrazine	Greenish yellow
Fluorene	Blue-green to dark green
Isoamylphenylhydrazine	Dirty purple quickly changing to brown
meta-Nitrobenzhydrazide	Yellow to yellowish green
para-Nitrophenylhydrazine	Light greenish brown
Phenanthrene	Bluish green to dark green
Phenanthrenequinone dioxide	Dirty violet-blue to reddish brown
Phenolphthalein	Orange outlined with purple-red
meta-Phenylenediamine hydrochlorate	Yellowish brown
Phenylhydrazine hydrochloride	Blue-green
Tetrabromophenolphthalein	Purple to brown
Thymolphthalein	Purplish red to brown
Triphenylguanidine	Purplish blue streaks with green to brown
Triphenylmethane	Brown with traces of purple

No Color Reaction.—Diphenyl, nitrobenzyl chloride, para-toluquinoline sulphate, para-toluthioquinanthrene.

MISCELLANEOUS COMPOUNDS—NOT GROUPED

Abietic acid	Brown
Amarine	Greenish blue to greyish black
Rheumatine	Brownish green to green
Salvarsan	Purplish black
Saponine	Caramel to dark brown
Thiosemicarbazide	Light blue-green
Turmeric	Yellow and pink-purple to brown

No Color Reaction.—Allyl thiocarbamide, santonin.

The color reactions for the tests, where an equal amount of impurity and also those where five times the amount were added to the strychnine, were recorded, but the listing of these would require too much space. Therefore, only those where the violet-blue was completely masked will be given. Reference can be made to the list of substances previously given to obtain the names of the compounds which did not completely cover up the strychnine test. Many of these gave no interference, while others gave more or less interference.

Organic compounds which completely covered up the strychnine test when present in equal amounts:

Acetylsalicylic acid, 5-iodosalicylic acid, salicylic acid, beta-naphthol, pyrogallic acid, diphenyl thiourea, and amarine.

Organic compounds which completely covered up the strychnine test when present in amounts five times that of the strychnine:

Apomorphine, colchicine, tryptophane, benzalacetophenone, acetylsalicylic acid, diiodosalicylic acid, diphenylacetic acid, gallic acid, 5-iodosalicylic, salicylic acid, tannic acid, 5-benzalamino-2-cresol, acet-beta-naphthalide, acet-alphanaphthalide, alpha-naphthylamine, beta-naphthalenesulphonic acid, beta-naphthol, beta-naphthylamine, acetyl-meta-aminophenol, acetyl-para-aminophenol, para-aminophenol, para-benzalaminophenol, ortho-chloromercuric-phenol, catechol, orcinol, phloroglucinol, pyrogallic acid, allyl thiourea, diphenyl thiourea, tolidine, thiobarbituric acid, amidazobenzene, phenylhydrazine hydrochloride, triphenylguanidine, abietic acid, amarine, rheumatine, and thiosemicarbazide.

From a study of the preceding data, we find that there are a number of organic compounds which give various shades of violet, lavender or purple, which might be mistaken for the strychnine test.

In general, the compounds giving a similar strychnine test do not belong to any definite group of organic compounds, nor does any special group seem to be responsible for the characteristic test. However, the characteristic test was not given by any of the aliphatic compounds tested.

There were very few organic compounds which completely covered up the strychnine test when present in small amounts, but when present in amounts five times greater than the strychnine, we find many interferences. Of course, in a carefully conducted examination for strychnine most of the foreign organic substances will be removed by means of different organic solvents.

CONCLUSIONS.

1. A large number of organic compounds have been tested with Mandelin's Reagent. A number have been found to give color reactions similar to strychnine.

2. The interference of organic compounds with Mandelin's test for strychnine have been determined when present in small and large amounts.

3. In toxicological work too much dependence should not be placed in the color reactions for strychnine. The test should be checked by the crystalline form, taste and physiological action.

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A POTENTIOMETRIC ASSAY OF CINCHONA.

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INTRODUCTION.

The assays of cinchona bark and its preparations have been studied comprehensively by various investigators. A very complete survey of the various methods of evaluating this drug is given by Dubreuil (1). This investigator favors the iodometric method of estimating the alkaloidal residue, as he claims it gives the most satisfactory results. McGill (2) applied electrical titration methods to the assay of this drug and obtained concordant results. The same method was applied to nux vomica and belladonna by McGill and Wagener (3) with an equal degree of success. In this work McGill and his associates (4) were able to eliminate the shaking out process. Very recently Maricq (5) applied the potentiometric titration to the estimation of alkaloidal residues. An excess of a solution of mercuric hydrogen iodide is added and the alkaloid is precipitated with the liberation of an equivalent quantity of hydrogen iodide. In a portion of the filtrate the hydrogen iodide is estimated potentiometrically using a mercuric chloride solution.

In a previous communication to THIS JOURNAL, the author (6) showed that it was possible to determine the quantity of alkaloid present in a solution, the hydrogen-ion concentration of the solution having been determined. From this datum the amount of alkaloid present was calculated.

It is the purpose of this present investigation to apply this method to the evaluation of cinchona alkaloid residues.

EXPERIMENTAL.

Method of Preparing Graph.—In the Pharmacopœial assay of cinchona bark the final extraction of alkaloids represents 4 Gm. of drug. A drug containing 7 per cent of alkaloids would yield 280 mg. of alkaloids. Using 0.0309 as the volumetric equivalent of these alkaloids in terms of 0.1*N* acid, 9.06 cc. of acid would

* Scientific Section, A. PH. A., Baltimore meeting, 1930.

be required to combine chemically with the alkaloids. Accordingly, 280 mg. of purified alkaloids were dissolved in this volume of acid and the solution made up to 100 cc.

Keeping the quantities of acid constant other solutions were prepared varying the quantities of alkaloid to correspond to different percentages of alkaloid present in the drug. The p_H of all of these solutions was measured electrometrically using a hydrogen electrode, Wilson (7) type. The following table shows the results of these measurements:

TABLE I.

No.	Percentage of alkaloid.	p_H of solution.
1	7.0	5.90
2	6.5	4.89
3	6.0	4.55
4	5.5	4.35
5	5.0	4.10
6	4.5	3.79
7	4.0	3.50
8	3.5	3.15
9	3.0	2.76
10	2.5	2.50

From these data a graph was constructed using the percentages of alkaloids in the drug as abscissæ and the p_H of the solutions as ordinates.

Obviously the reliability of this method of assaying cinochona would depend upon whether or not the p_H of these solutions was affected by the amounts of the different alkaloids of the drug varying. This possibility was tested by dissolving the various alkaloids in 9.06 cc. of 0.1*N* acid and determining the p_H of the solutions.

TABLE II.

No.	Proportions of alkaloids.		Amount of acid. 0.1*N*.	p_H.
1	Mixed alkaloids	200 mg.	6.06 cc.	4.12
2	Cinchonine	50 mg.		
	Cinchonidine	50 mg.		
	Quinine	50 mg.	9.06 cc.	4.05
	Quinidine	50 mg		
		200 mg.		
3	Cinchonine	75 mg.		
	Cinchonidine	25 mg.		
	Quinine	50 mg.	9.06 cc.	4.10
	Quinidine	50 mg.		
		200 mg.		
4	Cinchonine	50 mg.		
	Cinchonidine	50 mg.		
	Quinine	75 mg.	9.06 cc.	4.10
	Quinidine	25 mg.		
		200 mg.		

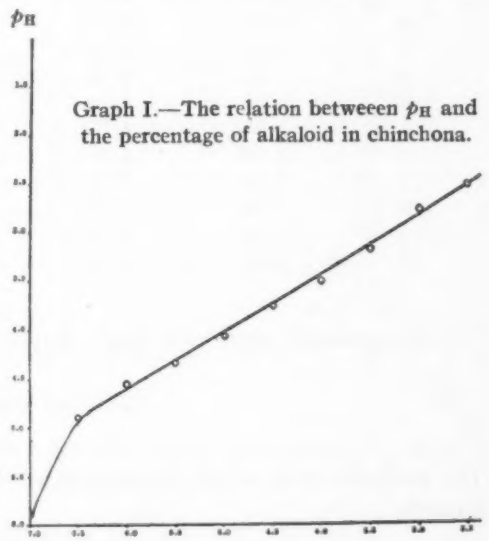
These results indicate that the p_H of the solution is inappreciably affected by varying the proportions of the alkaloids, but on the other hand it is a function of the entire quantity present.

Kolthoff (8) in the discussion of the author's former paper suggested the possibility of alkaloidal reduction by the hydrogen in the electrode, thus vitiating the results. Also Popoff and McHenry (9) suggest that McGill's results on the titration of cinchona were lower than the Pharmacopœial values due to alkaloidal reduction.

TABLE III.

No. of solution.	p_H with quinhydrone electrode.
1	4.11
2	4.06
3	4.12
4	4.14

By prolonged contact of these solutions with the hydrogen of the electrode catalyzed by the platinum black, the author has noticed slight fluctuations of the light on the galvanometer scale, which is possibly due to an oxidation-reduction potential. In order to determine whether or not this vitiated the results of the determination, the p_H of the foregoing solutions was determined by means of the quinhydrone electrode. Table III records these results. The electrode immersed in $M/20$ potassium acid phthalate solution at 18° C. showed this solution to have a p_H of 4.00.



Graph I.—The relation betweeen p_H and the percentage of alkaloid in chinchona.

These results seem to indicate that concordant results can be obtained by means of the hydrogen or quinhydrone electrodes.

Estimation of Cinchona Alkaloids.—A sample of unpurified mixed cinchona alkaloids was obtained from the drug and three samples were accurately weighed. Each was dissolved in a small quantity of neutral ether, 9.06 cc. of $0.1N$ hydrochloric acid added and the ether slowly volatilized leaving the alkaloids dissolved in the acid. These were made up to 100 cc., the p_H determined. The amounts of alkaloids were determined from the graph.

TABLE IV.

No.	Gm. present.	p_H.	Estimated electrometrically.
1	0.2032	4.09	0.204
2	0.2060	4.19	0.209
3	0.1990	4.04	0.198

Assay of Cinchona.—Having shown the use of this method in evaluating weighed samples of crude alkaloids, the method was applied directly to the assay of a sample of red cinchona bark. The following procedure was employed:

The Pharmacopœia process is followed through the point of decanting 160 cc. of the ethereal solvent. This, then, is evaporated to dryness. The residue is treated

once with alcohol and again evaporated to dryness. The alkaloids are then softened by means of neutral ether and dissolved in 9.06 cc. of 0.1*N* hydrochloric acid. The ether is evaporated, the solution made up to 100 cc. and the p_H determined.

It so happened that this sample of cinchona ran higher than 7 per cent. To make the method applicable to this sample of drug 100 cc. of ethereal solvent was employed for the electrometric assay. This represented 2.5 Gm. of drug, the percentage thus obtained from the graph which is based upon 4 Gm. of drug was multiplied by 1.6 to obtain the actual percentage. Sixty cc. of the liquid was subjected to the shaking out process and the alkaloids determined gravimetrically. Table V records the results of these determinations.

TABLE V.

No.	p_H.	Percentage from graph.	Calculated percentage electrometric.	Percentage gravimetric.
1	4.11	5.10	8.16	8.12
2	4.01	4.93	7.90	8.25
3	3.98	4.87	7.80	7.52
4	3.68	4.30	6.90	6.70
5	3.91	4.72	7.55	7.55
6	3.85	4.62	7.40	7.31
7	3.98	4.87	7.80	7.88
8	3.83	4.60	7.36	7.38
9	3.98	4.87	7.80	8.05
10	3.62	4.20	6.72	6.80
11	3.90	4.70	7.53	8.25
12	4.02	4.94	7.91	7.74
			Av. 7.57 per cent	Av. 7.63 per cent

The probable error of a single determination was determined by the formula:

$$r = \pm 0.6745 \sqrt{\frac{\Sigma(v^2)}{n-1}}.$$

The probable error of the average of all the determinations was calculated by the formula:

$$R = \pm 0.6745 \sqrt{\frac{\Sigma(v^2)}{n(n-1)}}.$$

In these formulas v is the deviation from the mean and n the number of determinations. For the electrometric measurements $r = \pm 0.28$ and $R = \pm 0.08$. For the gravimetric determinations $r = \pm 0.38$ and $R = \pm 0.11$.

Although the means of this series of determinations are practically identical, the probable error of the series by the gravimetric method exceeds the probable error of the electrometric determinations.

Assay of Other Samples of Cinchona.—Other samples of cinchona bark were assayed potentiometrically and gravimetrically. The following results were obtained as given in Table VI.

Equation for Graph.—An examination of the graph reveals that from 6.5 per cent the curve is a straight line. From this point to 3.0 per cent covering practically the range of assay of most samples of cinchona the equation for the curve was calculated. The method of averages was employed using the equation

TABLE VI.

Sample.	Percentage alkaloid gravimetric.	p_H.	Percentage alkaloid potentiometric.
A	5.67	4.40	5.65
	6.04	4.64	6.10
	5.61	4.40	5.65
	lost	4.31	5.53
	5.60	4.38	5.60
	5.53	4.28	5.47
B	5.40	4.26	5.42
	5.67	4.35	5.55
	5.67	4.29	5.48
C	4.50	3.60	4.15
	4.69	3.67	4.27
	4.52	3.65	4.25
		3.75	4.40
		3.66	4.26
		3.74	4.38
D Very inferior drug	3.24	2.88	3.10
reported only 3.00	3.31	2.90	3.15
per cent by analyst	lost	2.94	3.20
E	4.94	4.04	4.97
	4.77	3.96	4.83
	4.78	4.01	4.92
	4.91	4.04	4.97
	4.92	4.05	4.98
	4.94	4.04	4.97

$$y = a + bx.$$

The equation which fits the curve from 6.5 per cent to 3 per cent is

$$\text{Per cent} = 1.7\ p_H - 1.9.$$

Using the procedure of analysis described in this paper this equation makes it unnecessary for the operator to construct his own graph.

CONCLUSION.

A potentiometric method of evaluating the alkaloidal content of cinchona has been devised, which makes the shaking out process unnecessary. It is sufficiently accurate for a determination of this type.

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THE LEAF OILS OF WASHINGTON CONIFERS: IV. TSUGA HETEROPHYLLA.

BY ARNOLD J. LEHMAN AND E. V. LYNN.

Tsuga heterophylla is a tree, frequently 200 feet high, with a trunk 6–10 feet in diameter and short, slender branches. The bark is thin and dark, orange-brown changing to a cinnamon-red on older trees, and separated into narrow, flat plates by shallow fissures. The leaves are rounded at the apex, conspicuously grooved, dark green and lustrous on the upper surface, and marked below with broad white bands of rows of stomates. The leaves are from 6 to 18 millimeters long and 1.5 to 2 millimeters wide. The cones are small, being 18 to 25 millimeters long. The seeds are also small with a total length of about 3 millimeters.

The tree is known under various names. The ones in common use are hemlock, western hemlock, hemlock spruce, western hemlock spruce, western hemlock fir, Prince Albert fir, gray fir and Alaska pine. The last two are favorite names among lumbermen of the Pacific northwest.

Western hemlock is found along the Pacific coast from Alaska to northern California and as far inland as northern Idaho and northwestern Montana. It constitutes approximately 13 per cent of our forests and attains magnificent proportions in regions abundantly supplied with moisture. Exceptional trees have measured 8 feet in diameter and 250 feet in height. It is a constant companion of the western white pine, the two being found growing together in many localities.

The material for this work was obtained from trees growing in the same sphagnum bog from which the western white pine was taken. The younger trees were again selected. One sample of oil was prepared from 162 pounds of air-dried leaves, giving 90 Gm. of oil, corresponding to a yield of 0.12 per cent. It was somewhat viscid and deep red-brown in color with a yellow-brown fluorescence. Another sample was distilled from the fresh leaves and twigs, after separating the latter to some extent. After one cohobation, the amount of oil obtained from 290 pounds of material was 120 cc., corresponding to 0.09 per cent. This oil was light yellow and had an unpleasant odor. Constants of the two oils were:

	Leaves.	Leaves and twigs.
$d_{25°}$	0.9499	0.8741
$n_D^{20°}$	1.4935	1.4804
$[\alpha]^{25°}$	....	−17.33
Acid number	45.74	3.11
Saponification value	78.51	16.51
Ester as bornyl acetate	11.49%	4.69%
Alcohol as ester	9.01%	3.68%

The leaf oil was extracted with a 5 per cent solution of sodium carbonate to remove the free acids. After removing adhering oil by washing with ether, the aqueous liquid was acidified with sulphuric acid and completely extracted with ether. Upon evaporation of the solvent, there was left a solid mass which crystallized readily from petroleum ether in colorless, shiny plates. Analysis and the melting point of 121° C. identified this as benzoic acid.

0.1086 gave 0.2757 CO_2 and 0.0575 H_2O; 0.1050 gave 0.2664 CO_2 and 0.0500 H_2O. Found: C, 69.1 and 69.1; H, 5.8 and 5.4. Calculated: C, 68.8; H, 4.9.

The leaf and twig oil was rotated in a similar manner but only an oil residue was obtained, which was too small for further investigation.

The two oils were then mixed and extracted with 5 per cent sodium hydroxide. The aqueous liquid was shaken with ether to remove adhering oil and then acidified and completely extracted with ether. Removal of the ether from the extract resulted in a light green liquid which distilled between 250° and 260° C. The amount was too small to permit formation of derivatives, but analysis indicated $C_{17}H_{30}O_2$.

0.1213 gave 0.3405 CO_2 and 0.1257 H_2O. Found: C, 76.5; H, 11.4. Required, C, 76.6; H, 11.2.

The residual oil was fractionated at a pressure of 10 mm., that portion boiling below 100° C. being collected and purified by repeated distillation up to this temperature. It was then carefully refractionated under ordinary pressure, giving the following results: 140–150°, 2.8; 150–159°, 10.4; 159–164°, 9.5; 164–169°, 14.2; 169–173°, 16.1; 173–177, 8.5 per cent of the total oil.

The first fraction was light blue in color and possessed a very pleasant odor. Analysis showed that it contained oxygenated compounds, probably unsaturated, but no identifications could be made. The blue color gradually disappeared during further refractionation.

Alpha Pinene.—The second fraction, distilling mainly at 157° C., readily gave a nitrosochloride which mixed without depression of melting point with pure pinene nitrosochloride. The presence of α-pinene was still further confirmed by oxidation to pinonic acid, which was converted to the semi-carbazone, melting at 203° C.

Camphene.—The third fraction was treated with acetic and sulphuric acids as described by Bertram and Walbaum (1). The oily product was washed, dried and fractionally distilled. A small amount of solid isoborneol was obtained, melting point 206° C., which together with the odor is satisfactory identification for camphene in the original oil.

Beta Pinene.—The fourth fraction, which distilled chiefly at 164–167° C., was oxidized with potassium permanganate according to Wallach (2). The difficultly soluble sodium salt was acidified and extracted with ether, producing needles with a melting point of 120° C. These gave no melting point depression of pure nopinic acid, therefore identifying beta pinene in the fraction.

Beta Phellandrene.—The fifth and largest fraction was nitrosated in the usual way. A solution was made in twice its volume of petroleum ether, which was then superimposed upon a saturated solution of sodium nitrite, and the whole was maintained at —5° C. Glacial acetic acid was added slowly with continued shaking and, after it was all added, the crystalline magma was rapidly filtered. The product melted at 94° C., when rapidly heated at 103° C. From its amount, one may conclude that the whole fraction is almost entirely β-phellandrene, with possibly some of the alpha variety.

The last fraction, which was very small, should contain limonene or dipentene, but no hydrochloride or bromide could be obtained, at least not in the crystalline form.

Saponification.—The remainder of the oil was saponified with alcoholic potash for two hours. The greater part of the alcohol was then distilled off and water

was added to separate the oil, which was collected in ether, washed and dried. After removal of the solvent, it was subjected to repeated refractionation under reduced pressure and finally at ordinary pressure, collecting as follows: 177–185°, 2.8; 185–200°, 3.0; 200–216°, 3.7; 216–225°, 3.7; 225–260°, 6.6 per cent of the total oil. Analysis gave the following results:

Fraction	177–185	185–200	200–216	216–225	225–260
Sample, grams	0.1367	0.1501	0.1357	0.1352	0.1411
CO_2, grams	0.4232	0.4588	0.3916	0.3904	0.4313
H_2O, grams	0.1449	0.1586	0.1389	0.1418	0.1636
Per cent carbon	85.2	83.3	78.7	78.7	83.5
Per cent hydrogen	11.8	11.7	11.4	11.6	12.0

Attempts to prepare derivatives from any of these fractions were unsuccessful. The third and fourth were each oxidized with chromic acid to test for borneol and, although they gave a strong odor of camphor, no oxime or semicarbazone could be obtained in the crystalline state.

That portion of the oil boiling above 260° C. was fractionated repeatedly at 60-mm. pressure, the following fractions being obtained:

175–195°, 6.6; 195–215°, 3.7; 215–235°, 4.7; 235–260°, 1.8 per cent of total oil.

Cadinene.—The first two fractions were light green in color and insoluble in 70 per cent alcohol. Each was analyzed, the figures showing a composition $C_{15}H_{24}$. They were dissolved in dry ether and saturated with dry hydrogen chloride. After standing for some time, copious crystallization took place, especially from the second fraction which reacted almost completely. The crystals were identified as cadinene dihydrochloride, melting point 117–118° C.

Picene.—The third fraction was small, greenish yellow and also insoluble in dilute alcohol. It was treated with hydrogen chloride in the same way as above and set aside. After a few weeks plate-like crystals began to form and in another week practically all of it had crystallized. The crystals were purified from ethyl acetate and finally melted at 133° C. They proved to be identical with the hydrochloride of a sesquiterpene later found in spruce oil and named by us, picene.

The last fraction was not further investigated. It was dark brown, viscid and very small in amount.

The Acids.—The strongly alkaline liquid, which had been separated by saponifying the oil, was made acid with sulphuric acid and extracted with ether. After washing and drying the ether solution, the ether was removed, leaving a liquid which rapidly crystallized. This was found to consist entirely of benzoic acid, which had been previously identified in the free state.

SUMMARY.

The leaves of *Tsuga heterophylla*, mixed with some twigs, produced 0.09 to 0.12 per cent of an oil whose properties are described. The terpenes, constituting about 65 per cent, consisted of α-pinene, β-pinene, camphene and β-phellandrene. Benzoic acid was present, free and as ester, probably with borneol. Cadinene was identified, as well as a second sesquiterpene not previously described, which has been found later in *Picea sitchensis* and named picene.

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THE DEPORTMENT OF MONOBROMATED CAMPHOR IN REFERENCE TO COMPRESSED MEDICINAL TABLETS.*

BY GEORGE E. ÉWE.

Monobromated Camphor is "permanent in the air. . . . Melts at 76° C. and sublimes at a slightly higher temperature "according to the U. S. P. VIII." The U. S. P. IX also stated that Monobromated Camphor is "permanent in the air," but in addition, directed that it be preserved in well-closed containers, protected from light. In general, the literature does not emphasize the fact that this substance is definitely volatile; but in compressed medicinal tablet manufacturing practice it evidences a certain degree of volatility which warrants its consideration as a volatile substance.

Striking evidence of the volatile nature of this substance will be afforded by exposing a grain of the powdered substance to the air of the laboratory in a beaker covered with muslin, under which circumstances the monobromated camphor will have completely disappeared after several months. Two grains of the powdered substance when exposed to the air of the laboratory in a 100-cc. beaker covered with a single sheet of filter paper tied on with string required 7 months for complete volatilization. When 2 grains of powdered monobromated camphor were scattered on a 90-mm. filter paper with turned up edges and the paper so charged allowed to remain in a desiccator over sulphuric acid, a period of 2 months and 3 weeks was required for complete volatilization of the substance. About 2 Gm. of powdered monobromated camphor spread on a watch glass lost 0.7% in weight after 48 hours in a calcium chloride desiccator, 0.3% in the following 48 hours and exactly the same in 2 subsequent periods of 48 hours each. In an oven at 40–45° C. a 2-Gm. sample of the powdered substance lost 2.4% of its weight in 12 hours. At 50–55° C. a 2-Gm. sample lost 5.7% in weight in 7 hours.

A large number of various complex tablet granulations have been observed which suffered losses ranging from 1.3% to as much as 43% of their monobromated camphor content when subjected to drying operations on a manufacturing scale at practical degrees of elevated temperature, thereby necessitating adjustment of their content of this substance before compression into tablets. The windows of a room in which a tablet granulation containing this substance was being dried have been observed actually "frosted" with monobromated camphor when only a moderately excessive heat had been inadvertently applied.

Tablets containing monobromated camphor have been observed which became encrusted with glistening crystals of this substance after some time; although not to such a degree as to render the tablets unsightly. Apparently, the crystals were occasioned by volatilization of a portion of the monobromated camphor which subsequently re-deposited upon the outer surface of the tablets. Two such lots of tablets were assayed before and after brushing with a stiff camel's hair pencil with

* Scientific Section, A. PH. A., Baltimore meeting, 1930.

the object of dislodging the adherent crystals of monobromated camphor, the assays indicating that the encrustation of crystals represented 1.9 and 1.8%, respectively, of the total monobromated camphor content of the tablets. These experiments point out the possible effect of attrition in tending to lower the monobromated camphor content of tablets encrusted with this substance.

Since this substance is frequently employed in medicinal tablets and shows a certain degree of volatility which is manifested even at room temperature the effect of this tendency to volatilize, upon the content of this ingredient in compressed medicinal tablets, deserves consideration. Various batches of compressed compound medicinal tablets made to contain 0.5 grain of monobromated camphor along with several other medicinal ingredients when stored in cork-stoppered, flint-glass bottles in a dark closet for 1 year were moderately encrusted with glistening crystals of monobromated camphor at the end of the storage period and showed losses of from 3 to 9% of their content of monobromated camphor in that length of time. One sample from a partially-filled container showed a loss of 9.8%. On the average this type of tablet was found to lose around 5% of its monobromated camphor content in one year's storage under normal conditions, due to volatilization and to loss of crystals of monobromated camphor from the slight encrustation through unavoidable attrition.

While the loss of this substance which may be sustained by tablets when kept with reasonable care would probably be of little therapeutic significance, yet where the tablets are subjected to unsatisfactory conditions, such as exposure to direct sunlight, storage in an excessively warm location, undue attrition or exposure to air currents through neglecting to replace the stopper of the container, the loss may become serious.

RESEARCH LABORATORIES,
TAILBY NASON COMPANY,
BOSTON, MASS.

A STUDY OF THE DARKENING OF COD LIVER OIL IN THE PRESENCE OF IRON.*

BY A. E. BRIOD AND W. G. CHRISTIANSEN.

When poultry cod liver oil is handled in iron drums, the oil frequently darkens upon aging, and in order to study this change an extensive series of observation and analytical experiments was set up so as to include (*a*) the condition of the oil and (*b*) the contact with the iron surfaces. A typical sample of market poultry oil was used; *firstly*, in its original condition; *secondly*, after clarification through ordinary filter paper; *thirdly*, after drying the clarified oil, and *fourthly*, after alkali refining and drying the clarified oil. Each of these four types of oil was stored under four conditions: (*a*) without the presence of iron; (*b*) in contact with iron so that iron surface is 11.6 sq. cm. per 100 cc. of oil; (*c*) as in (*b*) except that the surface exposed is 116 sq. cm. per 100 cc. of oil, and (*d*) as in (*b*) except that part of the iron surface is above the level of the oil—in (*b*) and (*c*) the iron was completely immersed in the oil. The sheet iron used in this work was pickled prior to use. The results of this study are presented in the following table:

* Scientific Section, A. PH. A., Baltimore meeting 1930.—No discussion.

TABLE I.

Exp. No.	Type of oil.	Contact with iron sq. cm./100 cc. oil.	Original Condition of Oil. Moisture.	Acidity.	Iron content pts./ million.	Color Lovibond units.	Color, after 3 months.	Color change.	Iron content pts./ million.	Change in iron pts./ million.
1	As received	None	0.10%	1.25%	29	35Y 9.5R	35Y 13.2R	3.7R	...	...
2	As received	11.6	0.10	1.25	29	35Y 9.5R	35Y 13.5	4.0R	...	...
3	As received	1.16	0.10	1.25	29	35Y 9.5R	35Y 23.0	13.5R	187	+157
4	As received	1.16 (iron partly exposed)	0.10	1.25	29	35Y 9.5R	35Y 15.0	5.5R	74	+ 45
5	Clarified	None	0.07	1.20	15	35Y 9.5R	35Y 9.8R	0.3R	12	− 3
6	Clarified	11.6	0.07	1.20	15	35Y 9.5R	35Y 14.1	4.6R	25	+ 10
7	Clarified	11.6	0.07	1.20	15	35Y 9.5R	35Y 15.7	6.2R	28	+ 13
8	Clarified	11.6 (iron partly exposed)	0.07	1.20	15	35Y 9.5R	35Y 15.1	5.6R	...	...
9	Clarified and dried	None	0.012	1.15	17	35Y 9.3R	35Y 10.0R	0.7R	...	...
10	Clarified and dried	11.6	0.012	1.15	17	35Y 9.3R	35Y 10.5	1.2R	12	− 5
11	Clarified and dried	11.6	0.012	1.15	17	35Y 0.3R	35Y 12.0	2.7R	19	+ 2
12	Clarified and dried	11.6 (iron partly exposed)	0.012	1.15	17	35Y 9.3R	35Y 12.5	3.2R	...	...
13	Clarified, refined and dried	None	0.017	0.03	14	28Y 2.6R	28 2.3R	−0.3R	...	...
14	Clarified, refined and dried	11.6	0.017	0.03	14	28Y 2.6R	30 2.5	2Y −0.3R	8	− 6
15	Clarified, refined and dried	11.6	0.017	0.03	14	28Y 2.6R	35 3.0	7Y 0.4R	9	− 5
16	Clarified, refined and dried	11.6 (partly exposed)	0.017	0.03	14	28Y 2.6R	30 3.5	2Y 0.9R	..	...

It is evident from the above results that dehydration without removing the fatty acids retards the darking and prevents any increase in the iron content of the oil when the latter is stored in contact with iron. If, in addition to being dried the oil is alkali refined, the rate of color change is still further decreased. Probably the dehydration is the more important factor, because when the moisture is removed the acid in the oil loses some ability to attack the iron. If the acid were removed without any dehydration, it is likely that acidity would redevelop and the corrosion and color change would proceed as in an oil which has merely been clarified.

RESEARCH DEPARTMENT OF THE CHEMICAL AND PHARMACEUTICAL LABORATORIES
E. R. SQUIBB & SONS, BROOKLYN, N. Y.

ARSENIC DETERMINATION IN BISMUTH AND BARIUM SALTS.*

BY L. W. GREEN AND R. E. SCHOETZOW.

The Gutzeit test is employed by the U. S. P. X in the detection and determination of minute amounts of arsenic in most of the materials tested. It employs the Bettendorf test, however, in the case of barium sulphate and salts of bismuth.

Our experience has indicated that the Gutzeit test is sensitive and accurate to one part per million of arsenic (As_2O_3), especially if a gram sample is used instead of two-tenths of a gram, as specified in the U. S. P. X, whereas, the Bettendorf test is sensitive to only ten or twenty parts per million and is not even roughly quantitative. In view of this superiority of the Gutzeit method, it would seem desirable to also use the Gutzeit test for barium and bismuth salts. These products are widely used for internal administration and should be carefully tested.

For the purpose of determining the usefulness of the more accurate Gutzeit test for this purpose, we applied the test to samples of barium sulphate, bismuth subcarbonate and bismuth subnitrate. At the same time, a series of tests was made on the same samples to which two parts per million of arsenic (As_2O_3) had been added. In all cases, satisfactory stains were secured. The various bismuth and barium salts gave strains, which corresponded to less than one part per million of arsenic. The salts to which two parts per million of arsenic had been added gave characteristic arsenic stains, which indicated slightly more than two parts per million. In the case of the bismuth salts, the reaction is apt to be rather violent, but this is no serious objection, since it may be controlled, by placing the apparatus in a bath of ice water.

Bettendorf tests on the barium and the bismuth salts to which two parts per million of arsenic were added gave negative results in both cases.

Our experience indicates that the Gutzeit test is preferable to the Bettendorf test for bismuth and barium salts, since it seems distinctly more sensitive and it is at least approximately quantitative, while the Bettendorf is not.

ANALYTICAL LABORATORIES,
PHARMACEUTICAL & CHEMICAL DIVISION,
E. R. SQUIBB & SONS.

GERMAN PROPRIETARY MEDICINE TRADE.

According to German foreign trade statistics exports of prepared medicines valued at about 28,000,000 marks in 1924 have about tripled to a value of 78,500,000 marks in 1929 and to 51,000,000 marks in the first eight months of 1930, or at the rate of 75,000,000 marks in the calendar year 1930. Germany's production of medicinal and pharmaceutical preparations amounts to approximately 700,000,000 marks retail value annually. (Trade Commissioner William T. Daugherty, Berlin.)

DISTRIBUTION OF MEDICINALS IN CANADA.

It is stated that two well-known drug firms now operate in Canada with dealer organizations covering rural districts. One of these firms is reported to have 600 travelers disposing of products direct to the consumer. Canadian representatives for drug lines state that in practically all cases where sizable sales volumes are attained, the goods sold are frequently packaged, or even partly manufactured and packaged in Canada. (Trade Commissioner Harvey A. Sweetser, Toronto.)

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* Scientific Section, A. PH. A., Baltimore meeting, 1930.

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A POSSIBLE MORPHINE SUBSTITUTE.

In a preliminary note on the therapeutic administration of benzene-sulphonate of oxydimorphine A. Leulier and B. Pommé (*Bull. acad. méd.*, through *B. M. J.*) remark that although oxydimorphine is very different from morphine pharmacologically, there is a close resemblance in chemical constitution. Kohn-Abrest states that it possesses none of the narcotic effects of morphine, but will produce clinical features characteristically absent in morphine addicts, namely, cough, vomiting, excessive intestinal peristalsis and flatulence, blood-streaked diarrhea, a rapid pulse and vascular dilation. The salt is crystalline and forms a neutral solution in water (solubility 1 in 33), which can be sterilized at 100° C., and is painless on hypodermic injection. A dose of 0.1 gram was administered to each of two guinea-pigs, the one by the mouth, and the other hypodermically; six hours later the slightly somnolent animals were killed, and the alkaloid, which had by then disappeared from the blood, was recovered from the liver. A morphine addict, taking 0.05 Gm. per day, had 0.04 Gm. of this dose replaced by an equivalent amount of oxydimorphine. In a month it was possible to keep him on 0.005 Gm. of oxydimorphine alone. The patient had the same feeling of euphoria as with morphine, but complained of peripheral vaso-dilatation and, during the first two or three days, had two or three actions daily instead of his usual one. A patient with severe Pott's disease of the cervical vertebrae, causing root-pains in the upper limbs, obtained relief from pain for several hours with the injection of 1 ccm. of a 1 per cent solution of this drug. The authors conclude from these early experiments that oxydimorphine possesses the anæsthetic and euphoric qualities of morphine, at any rate, when administered in small doses. The euphoric action, indeed, raises the question whether, owing to the risk of a habit being formed, restrictions should not be placed on its sale.

VISUALIZING MATERIA MEDICA.*

BY C. J. ZUFALL.

In teaching Materia Medica the spoken or written word is relied upon too much to convey to students ideas which will stick. Authors and teachers improve greatly upon these by the use of pictures, and a good picture will often tell a better story than can be told in several pages of writing. Better still, however, is to display the actual objects and material involved in the story to be told.

Some stories in Materia Medica are simple. For example, a pressed specimen of *Chondrus crispus*, in its natural color, beside which is placed a pressed specimen of the drug as found on the market, tells the student immediately that the only thing done to the seaweed is the bleaching. A similar display of the drug *Fucus* shows that the drug is only the dried seaweed. Under *Agar* such a display of the official product and the seaweed from which it is obtained tells the student that something more complex than simply drying or bleaching must have taken place in order to produce the mucilaginous product known as Agar.

A mounted specimen of *Mentha piperita*, beside which are vials of oil of peppermint and menthol, shows at a glance the relation of these three U. S. P. drugs.

The story of *Aspidium* is also told by such a display. The pressed plant with a portion of the rhizome and stipes cut away to show the green active portions may be placed in a Riker mount. Beside it are displayed representative pieces of the crude drug as it appears on the market. This crude drug shows that the rhizomes and stipes have been peeled; then, a vial of the oleoresin is included as the active constituent. Beside this is a tapeworm sealed in a glass tube to show the therapeutic value of the drug.

A similar display for *Chenopodium* is also of much value. This includes the pressed specimen of the plant showing the part distilled; a vial of wormseed; a vial of the oil; a vial of ascaridol, the active constituent; and then a roundworm sealed in a glass tube to show the therapeutics of *Chenopodium*.

Showing the method of producing turpentine, we have in our laboratory a four-foot log of a long-leaf pine tree which was cut from a tree which had actually produced turpentine. There are still attached to it the gutters and cups used to catch the drip. Along with it are displayed the oil of turpentine, rosin, tar, oil of tar, wood oils, terebene, etc., to show the various medicinal substances derived from the tree.

In the study of *Ergot* each student uses in his laboratory studies a head of rye infected with ergot. For convenience of handling and the protection of the material it is placed in a test-tube and held in place by a cork.

Similarly prepared is the seed of *Strophanthus* Kombé with its awn attached. The awn would be broken off if it were not protected in the test-tube.

ABSTRACT OF DISCUSSION.

L. D. Havenhill inquired whether specimens of the drug were passed to the students. The author replied in the negative, stating that these are examined in the laboratory.

In reply to **A. B. Lemon**, the author stated that there was no difficulty in obtaining the required number of specimens.

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* Section on Education and Legislation, A. PH. A., Baltimore meeting, 1930.

Referring to the mention of lantern slides Rudolph Raabe inquired whether the author would supply others than students of his school, the author replied he had the negatives and would have slides made, if request was made for them.

THE SEARCH FOR THE ACTIVE PRINCIPLES IN THE NARCOTIC SOLANUMS.*

BY FRED B. KILMER.

Through all races and peoples, among the most primitive and the barbaric, in widely separated lands, there is found an inherent belief of a mysterious power or essence in-dwelling in living plants.

In plants of the nightshade kind, there lay a power that would allay pain, intoxicate, kill. Through the ages, in the legends of the savage, in the lore of the peasant, there lives a story of the Mandrake, the Henbane, the Daturas, the Belladonna, and their peculiar power to stupefy, cure and poison.

The people of the ancient pagan world attributed these powers to superhuman agencies. From good spirits came the properties which were benign. Those which were destructive or harmful had their origin in spirits which were evil—devils. The wise man, the man of magic, the priest, crude forerunners of the scientist, believed that in his own person there was power to control these unseen dominions. Plants were poisonous or benign, according to his will.

Men skilled in so-called science through the centuries have continuously searched to find and to explain this hidden power.

Plato and Aristotle, held that these virtues were due to the varying preponderance of the elements—moist, dry, heat, cold. With Plato, the "harmonious love" between the elements instilled into plant life their beneficent virtues. From the "wanton love" of the elements arose their destructive power. Such classical writers upon Materia Medica as Dioscorides and Galen for the most part describe the properties and uses of vegetable drugs without attempting to explain the origin or cause of their power. It is notable, however, that in the case of certain poisonous drugs they at times inclined toward ascribing to them an occult power, perhaps a satanic influence, controllable by the use of charms, amulets and incantations. Of more than passing interest is the recognition by these writers of certain plant drugs which, through an identity or similarity of active principles, might be used interchangeably. Galen gives a table in which several of the solanums are so similar or equivalent in effect as to be interchangeable:

"Instead of dorycnium (belladonna)—the seed of henbane.

"Instead of halicacabus, the seed of strychnos.

"Instead of mandragora, dorycnium.

"Instead of the seed of henbane, the seed of sweet briar."

Here we have an inkling of our later discovery of identical active principles (alkaloids) in several of the narcotic solanums.

During the Middle Ages, Albertus Magnus taught that the active properties of plants were produced by the combination of five virtues: "that of the element which preponderates in the composition of the plant, the coöperating virtue of the

* Section on Historical Pharmacy, A. PH. A., Baltimore meeting, 1930.

other elements which are mixed with it, the virtue of the proportion in which they are mixed, the influence of the stars, and the virtue of the vegetable soul." "The virtue of the place (where the plant grows) and the virtue of the surrounding air are also effective."

The real work of alchemy, as defined by the alchemists themselves, was not to produce gold, but to prepare medicines. By a combination of the four elements (earth, fire, air and water) plus the trinity (mercury, salt, sulphur) the alchemists sought to produce the "universal medicine."

In drugs of manifest power, including poisonous substances, there was present an active principle, the "quintessence" of the alchemists. As defined by Paracelsus, "every substance is a compound of various elements among which one dominates the others, and impresses its own character upon the compound. This dominating element, disengaged, is the quintessence." If Paracelsus had been able to extract or separate from the henbane, stramonium, belladonna or from any of the narcotic nightshades the active principles which we call alkaloids, he would have attained the long-sought "quintessence."

THE OCCULT POWER OF THE NIGHTSHADES.

Through the centuries in medical annals we meet with the story of the "occult power" and the "occult virtues" of amulets, incantations, prayers, words, doings, stones, drugs and herbs. Arnold of Villanova, a 13th Century theologian and scientist, found in occult virtue "a property not immediately perceptible to the senses as are heat, light, cold, color, odor and taste, and also one whose existence cannot be learned by reason or experiment, but only by chance discovery." Occultism, in its inception, stood for a science born of "experiences" (experimental science) and from the beginning has been a science which investigates hidden things of nature. The occult power residing in the deadly nightshades is pictured in the records of ancient Babylon, and runs on through the "fathers" quite down to our own time. It is not easy to make anything out of the tangled mass. The noxious and malignant powers were in part intelligible, and in another part recondite and occult. Through some occult causes these plants varied in their power to react upon the body. Belladonna and stramoniums were always poisonous; the henbanes and the mandrake were rarely so classed. Through some occult principle, a small amount produced a poisonous effect; at other times a large amount showed no action. Our present knowledge leaves us still in the occult stage when we bury these varied actions under such terms as "immunity" and "idiosyncrasy." The great Galen taught that innocent qualities of such drugs as the narcotic solanums could through some occult power cause poisonous symptoms. Mathiolas wrote that the poisonous powers in the solanums "could act at the same time in a manifest and in an occult manner." Through some occult power certain parts of the noxious solanums were more active than other parts. With belladonna, the power of the berries was greater than the leaf or root. In stramonium, the seeds were the more active. With the mandrake, all power resided in the root. Possibly it is through tradition of the occult that makers of official standards adopt only certain parts of drug plants, and reject other parts, without regard to their content of active principles.

In the Middle Ages, the narcotic nightshades were carried into the cloister.

The power of the heathen gods and devils over them was exorcised by incantations and prayers. The mandrakes, henbanes and the daturas were cultivated in the monastic gardens and "purified" preparations made therefrom. At the close of the mediæval period came the printed volume. In the flood of herbals and pharmacopœia-like books the narcotic nightshades hold an exalted place, the mandrake generally filling the center of the stage. The potency of these drugs is made known. By reason of their poisonous power, at times they are banned from use in medicine. The mandrake is endowed with most marvelous attributes. The origin of their power was placed in the heavens, or they might be hell-born. They were controlled by gods and by devils. But the real source of their power had not been revealed to man. In the Seventeenth Century, a Wurtemburg physician, Matthias Faber, devoted ten years to the study of "Strychnos Manicum" (belladonna) and the allied solanums. In a monograph (issued 1677) he cites the authorities from the most ancient down to his own time, the whole forming a most complete study of the narcotic solanum group. Dramatically, and with poetic artistry, Faber places the origin of the occult power of the solanums "in the celestial channels of divinity—the stars." The powerful solanums were "born of the dread Saturn." Solanum "the companion of Mars" changed in form with every conjunction with the sun, Solanum "the comrade of Mercury" carrying implements of destruction. The varying phases of the placid Luna governed the solanum's maddening virus. Faber's views may be taken as representative of the orthodox beliefs of the latter half of the Seventeenth Century.

THE MYDRIATIC POWER.

In our day the most striking action of this group of narcotic solanums is their power to dilate the pupil of the eye. Yet this mydriatic action has been noted, lost and re-discovered more than a dozen times in the history of the plants. This action was known to Galen and other ancient authorities, but it was apparently looked upon as without importance. For many centuries, statements as to the action of these drugs upon the pupil of the eye are not recorded. The illustrious Boerhave, in the Seventeenth Century, as if to settle the question, states specifically that the juice of the belladonna had no action upon the eye. Faber, who, in the Seventeenth Century, devoted ten years to the study of the narcotic solanums, makes no citation in his abundant references as to the mydriatic action. In cases of poison which came under his own observation, he notes the "dimness of vision," but he attributes this phenomenon to the secondary action of the poison, and not to the mydriatic power of the drug. Nearly half a century after Faber, Sicelius (1724) reviewed the literature of belladonna and allied drugs, without making any note of their mydriatic action.

Fifty years after Sicelius, and a hundred years after Faber (1774), Peter John Andrew Daries, a Hamburg drug clerk, opened the way that led to the placing of this group of drugs in their rightful place as mydriatic agents. In making up a prescription, Daries spattered some of the juice of belladonna berries in his eye. Enlargement of the pupil and partial blindness followed. This accident led him to make an extended investigation of the action of the drug upon animals and birds, in which he was assisted by medical friends. This work clearly demonstrated the mydriatic action of the drug and suggested its practical use in operations upon the

eye. After forty years (1816) another drug clerk, Runge (famous for his work on aniline colors), spattered the juice of hyoscyamus in his eye. Enlargement of the pupil followed. With the spirit of a modern pharmacologist, Runge, assisted by colleagues and with the encouragement of the poet, Goethe, experimented with stramonium, belladonna and hyoscyamus, noting the mydriatic action upon animals, birds, etc. Runge produced an acid solution of the crude mydriatic bodies present in the drugs, which substance he called "koromegen" (Greek—Magnifier of the pupil). The labors of these two clerks clearly demonstrated the presence of mydriatic bodies in these solanums, and in the final outcome bestowed immeasurable blessings on the human race.

The early decades of the Nineteenth Century were notable in the history of the search for the vegetable alkaloids. Morphine, nicotine, quinine, caffeine, strychnine and emetine were among those definitely separated. Following the lead opened by the two drug clerks, Daries and Runge, many chemists had sought for the alkaloid we know as atropine. It was finally separated in 1833 by two German chemists, Greiger and Hess, and almost simultaneously by Mein, a German pharmacist. . . . From these years forward up to now, chemical and pharmaceutical workers have labored earnestly in an endeavor to establish the identity of the alkaloids found in the solanaceous group of plants. Their presence in the various species of the narcotic solanums has been investigated. Their presence in various parts of the plant structure and various periods of plant growth has been most fully studied. At the present time, the following alkaloids are classified as properly belonging to the group:

Apoatropine and belladonnine, $C_{17}H_{21}O_2N$
Atropine and hyoscyamine, $C_{17}H_{23}O_3N$
Norhyoscyamine and noratropine, $C_{16}H_{21}O_3N$
Hyoscine (scopolamine), $C_{17}H_{21}O_4N$
Tropacocaine, $C_{15}H_{19}O_2N$
Meteloidine, $C_{13}H_{21}O_4N$

PHARMACY.

Consciously and unconsciously, pharmacy has ever taken into account the active principles residing in the narcotic solanums. Primitive man found that the fresh plant, bruised, and applied as a poultice or plaster, carried the anodyne (pain-quieting) power. Arab pharmacy produced from this a concentrated juice or "rob" in which the potent constituents were held in solution in the plant acids. In turn, pharmacy elaborated wines, vinegars and tinctures, each of which carried the active constituents of the drugs. Without any knowledge of the synergistic or the antagonistic action of drugs one upon another, polypharmacy produced mixtures of the narcotic solanums with a dozen or more drugs. As we look back upon these compounds, we wonder what became of the basic active constituents of the solanums. We can see that some of the added drugs might have increased their efficiency. With other additions it would seem that their power must have been modified. Historically notable was the mixture of the extracts of narcotic drugs, including the mandragora, hyoscyamus, opium, etc., used to produce narcosis through many centuries prior to the discovery of ether or chloroform. Here we have an

empirical exhibition of the active principles of these narcotic drugs acting one upon another: an anticipation of modern synergism: forerunner of our scopolamine morphine combinations to produce narcosis (twilight sleep).

When, in later centuries, pharmacy learned how to separate certain active constituents from the drug itself, the pendulum swung to the other extreme. Alkaloidal medication supplanted polypharmic mixtures. It was found, however, that these bodies did not, in all respects, represent the whole drug. With certain drugs there were constituents other than the so-called "alkaloids" which exerted an important influence upon the drug action. With many drugs, of which digitalis is a notable type, potency seemed to reside in a series of ill-defined substances called "glucosides." Thus, when, apparently, the long-sought "quintessence" had been found, it was realized that there was a "something" that was still needed.

In establishing pharmacopœial standards for the narcotic solanums, the pharmacopœial authorities have, in many instances, followed tradition and recognized a particular species of plant, or a certain part of the plant irrespective of the alkaloidal or pharmacological value of other species or other parts of the official drug. There are those who, with force, urge that in our pharmaceutical preparations we only exhibit one of the several active constituents. We are presenting only a fractional part of the whole drug. On the other hand, there are, undoubtedly, official mixtures wherein the essential active constituents are masked, neutralized, "buried" among many extraneous ingredients.

An episode in the search for the active principles of medicinal plants was of American origin. Following the discovery of the principles known as alkaloids, an attempt was made to separate certain resinous bodies, particularly those found in native American plants. The original process consisted of extracting resinous bodies from the plant substance by alcohol, obtaining a tincture, to which water was added, which separated the resinous bodies, the alcohol being recovered by distillation. They were confusedly termed "alkaloids," "resinoids," with similar designations. Out of the host of such preparations exploited, only a bare half-dozen remained in use. It was acknowledged that the term "alkaloids" was misapplied. In the main, the preparations were either crude drug resins or resinous products, together with a number of what were termed "unclassified concentrations."

Possibly pharmacy, even after all the centuries of study, has not yet succeeded in producing preparations containing the real "quintessence" of the solanaceous and other drugs. When we may be able to do this, medical practice may be induced to return to drugs. In the latter half of the Nineteenth Century the veil covering the constitution of the alkaloids began to be lifted. Out of extended research the following facts seem to have been established: The bases which are found in the same plants were found to possess, in general, not only analogous empirical formulas, but also a similar chemical constitution. Many alkaloids found in one and the same plant can be successfully converted one into the other. Thus, morphine into codeine, hyoscyamine into atropine, etc. Viewed from a chemical standpoint, the alkaloids were found to constitute a sharply defined class, inasmuch as they are all, or nearly all, derived from one and the same base, *viz.*, pyridine. Here arises a question: Is the pyridine or similar base the real active principle—the alkaloid—or must we seek further? Again, if we gain control of the base, can we produce the

alkaloidal bodies at will? In the laboratory we have produced synthetic alkaloids. In a few isolated instances the production of alkaloids in the plant has been stimulated. This is as far as we are able to go with our present knowledge.

WHY AN ALKALOID?

Primitive man classified plants according to their utility. The narcotic solanums were useless for forage or food. They gave no woody fibre for shelter or clothing. To him, in one sense, they were weeds, and in many ways they are still in this class. But the cave man found in these plants a power for good and for evil, and utilized this power. Through the centuries the narcotic solanums have held their place by reason of the medicinal power residing in their active principles, their alkaloids. Why are these bodies present in this group of plants? What is the function of alkaloidal bodies in plant life? After ages of study, we have no answer. Investigators have urged that these bodies are stored in the plant as protectives against animal enemies. This idea seems fallacious. The narcotic solanums are not food plants. By their odor and constituents they do not attract (in fact, they repel) food-seeking animals. Instances are recorded of animals feeding on these plants without harm. Birds eat their fruits. Worms and insects vigorously attack and destroy them. Their plant enemies seem to be immune to their poisonous power.

The alkaloidal bodies appear in all portions of the plant structure. At certain stages of the life history of the plant the proportions vary. In a slight degree, the proportions of the alkaloidal bodies are influenced by climate, soil and environment. Methods of cultivation have not resulted in securing any notable increase of alkaloidal content. It has been suggested that the presence of hyoscyamine, atropine, hyoscine and like bodies in closely related species of the narcotic solanums may, in a measure, result in the influence of environment through the ages. There is much that is not yet clear as to the influence of environment upon plant life, and of plant life upon climate. That the alkaloidal bodies are formed somewhere during metabolic process of plant life is about as far as we have been able to go. In the life processes of the plant akin to what might be termed "digestion" the alkaloidal bodies seem to be elaborated. It has not been shown that the alkaloidal bodies formed in the narcotic solanums have any direct bearing upon the life processes. While it is true that the nitrogen in the alkaloids is an organic combination, it has not been found that they are in any way able to minister to the nutrition and growth of the plant. If the narcotic solanums were supplied with nitrogen solely through their alkaloids, they would starve.

Again, there comes the suggestion that these bodies are in the nature of excreta. A plant, in the ordinary sense, has no excreta. The matter deposited in the bark of trees and in leaves about to be shed may, however, be considered as dead matter—excreta. The narcotic solanums produce but little bark substance. In the plants of this group, the alkaloidal contents of the leaves disappear before they are shed. It is thus difficult to define the place and purpose of the alkaloids in the narcotic solanums. One hazy, perhaps untenable, suggestion might be offered. In some way they may act as catalytic agents, formed in the plant protoplasm, utilized by the plant in carrying out the processes necessary for life, growth and reproduction.

CONCLUSION.

Behind the veil in the Jimson Weed, the hyoscyamus, the belladonna and the mandrake, man found a power that would stupefy, blind, kill, cure. After decades of centuries we pick out a mysterious something which we name an "alkaloid" that will do the same thing, and exclaim "Eureka!" Then we begin to ponder as to why these untellable substances are found in these plants only, and why the elements which we call carbon, hydrogen, oxygen and nitrogen, form in certain nightshades these particular and peculiar alkaloids. Under our present knowledge, the active principles or alkaloids found in the narcotic solanums seem to be as follows:

NAME OF PLANT.	CONSTITUENTS.
Atropa Belladonna	Chiefly hyoscyamine
Datura arborea	Chiefly hyoscine with hyoscyamine
Datura fastuosa	Hyoscine alone or with hyoscyamine
Datura meteloides	Chiefly hyoscine: occasionally a little hyoscyamine or atropine
Datura quercifolia	Hyoscine and hyoscyamine
Datura stramonium	Chiefly hyoscyamine
Duboisia myoporoides	Hyoscyamine, hyoscine
Hyoscyamus albus	Hyoscyamine and hyoscine
Hyoscyamus muticus	Hyoscyamine
Hyoscyamus niger	Chiefly hyoscyamine with some hyoscine and atropine
Hyoscyamus reticulatus	Hyoscyamine and possibly other alkaloids
Scopolia carniolica	Hyoscyamine with hyoscine
Scopolia japonica	Hyoscyamine

In our every-day drugs there are still things beyond our vision. In many of them we find no "active principles," no alkaloid, the test tube reveals nothing measurable, and yet they carry great power.

"Beyond all that the eye may see, that the ear may hear, that the hands may feel, outside of taste, smell, outside of any native sense, there lies an unseen, unheard, unfelt universe, whose fringe we are just beginning to explore." (New Conceptions in Science.)

SUNLIGHT ON EPHEDRINE SOLUTIONS.

Edwin E. Moore and Marjorie B. Moore have reported that aqueous solutions of ephedrine hydrochloride and ephedrine sulphate in quartz or flint-glass containers were found to be resistant to the action of sunlight, whereas aqueous and oil solutions of the free base were quickly decomposed under the same conditions. Removal of oxygen from the solutions at least greatly retarded, if not completely prevented, the decomposition. The products formed varied with the conditions as temperature solvent, etc. Benzaldehyde, benzoic acid, benzal-ephedrine, amines, etc., have been identified. Certain dyes accelerated the decomposition, while others retarded it. Amber and some other colored glasses inhibited the action.—American Chemical Society.

DETECTION OF PHENACETIN.

By moistening a trace of phenacetin with acetone and 2 to 3 cc. of concentrated sulphuric acid, a red color will show, deeping in intensity when slowly heated on a water-bath with constant stirring, according to Charletti (*Giorn. di Ch.* through Sept. *Drug. Circ.*). When the mixture is diluted there will separate a brownish blue precipitate which dissolves in concentrated sulphuric acid with a red color. This seemingly depends upon formation of a condensation product of acetaldehyde and phenacetin. It is found that 1 mg. of phenacetin will give this reaction. Formaldehyde, trioxymethylene or hexamethylenetetramine will not produce this color.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

SOME COMPLEXITIES IN QUANTITY DISCOUNT AND FREE GOODS OFFERS.

BY PAUL C. OLSEN.

The desirability or salability of merchandise is determined by the druggist's answer to just one question. That question is, "If you were rid of this merchandise, would you order any more of it?"

If the answer is, "No," it is obvious that the present stock is considered unsalable or undesirable to that extent.

The serious aspect of a large part of a druggist's merchandise stock being in unsalable or undesirable merchandise is that the smaller part of his stock must produce all or practically all of the net profits. Is it any wonder, then, that in many drug stores these net profits are decidedly unattractive? This is inevitable when a small share of the stock must produce a large share of the profits.

One of the reasons that the bulk of the stock in so many stores is composed of unsalable or undesirable merchandise is the prevalence of quantity discounts and free goods offers. Profits are determined in a drug store by three factors: the gross margin obtainable on the merchandise, its rate of turnover and the volume of sales possible in that item.

Of these three the only one that can be determined at all definitely in advance is gross margin. It is natural, therefore, that it should receive the largest share of the attention of a druggist trying to increase the profits of his store.

Unfortunately, this one determinable element affecting net profits is only one of three of these elements. Furthermore, experience indicates that for many items it is the least important of the three.

Also, it is well to remember that, of these three elements of profit, gross margins are the most easily recognized and understood. The effect of turnover and volume is harder to understand and, as suggested above, more difficult to measure.

The numerous and complex quantity discount and free goods offers available to druggists to-day make one wonder that it is possible for a druggist to keep even as much as 25 to 35 per cent of his merchandise stock in salable merchandise. The free goods offers which are currently available occupy page after page in wholesalers' listings. An examination of the advertising in drug-trade journals presents further

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evidence of the prevalence of a great variety of free goods and quantity discount offers.

One of the great difficulties in determining whether or not to accept a free goods offer is the difficulty in determining whether or not the discount or free goods offered are a sufficient inducement for a larger purchase. That is to say, will the extra gross margins compensate for the reduced turnover?

It is obvious, also, that consideration should be given to the selling possibilities of the merchandise. No matter how attractive the gross margins are on some items of merchandise, the purchase of them is a liability rather than a profit opportunity if the merchandise cannot be sold.

A detailed examination of one current free goods and quantity discount offer will make clear just why it is that there is so much difficulty in avoiding accumulations of undesirable or unsalable merchandise.

The manufacturer of a well-known item of toilet goods permits direct purchases by retail druggists when a gross or more of this item is bought at one time. The item lists for $4.00 a dozen. A purchaser obtains on this direct order of one gross a discount of 15 per cent and free goods of a quarter of a dozen with each dozen.

If he buys this merchandise from the wholesale druggist, he gets customarily a 10 per cent discount and free goods of one-sixth of a dozen with the dozen.

Should he buy this merchandise directly from the manufacturer or through the wholesale druggist?

It is a complicated task to calculate, first of all, the net cost per item or per dozen of the merchandise bought in the two ways for purposes of comparison.

To do this, it is necessary to proceed in the following way.

A twelve-dozen purchase with a quarter dozen free with each dozen means that on an order for twelve dozen the retail druggist actually receives fifteen dozen. For these fifteen dozen, he pays $48, less 15 per cent, less 2 per cent for cash. The quantity discount of 15 per cent is a saving of $7.20, making the net amount of the invoice $40.80. If the retail druggist takes, in addition, the cash discount of 2 per cent, he saves 82-cents more, making the net cost of the fifteen dozen $39.98. Dividing fifteen into this amount to get the net cost per dozen shows the cost per dozen to be $2.67 or about 22 cents each.

Buying from the wholesaler a dozen at a time, he pays $4.00 a dozen less 10 per cent and 1 per cent for cash and receives a sixth of a dozen free with his dozen purchase. The net cost of the fourteen items is thus $4.00 less 10 per cent, which is $3.60, less a 1 per cent cash discount amounting to 4 cents making the net cost $3.56. Dividing fourteen into this amount, the net cost of each item is about 25 cents each or $3.00 a dozen.

The indicated saving in the purchase price direct as contrasted with buying from the wholesaler is thus about 11 per cent. Notice the rather elaborate calculations which are necessary to finally determine what the apparent saving actually is. Both purchases have to be reduced to a common denominator, which is either the cost per item or the cost per dozen, and this is not easy to do when free goods in varying amounts are given with purchases being compared.

One other important item remains to be considered and that is this. How long will it take to sell the merchandise? If 15 dozen (a gross plus free goods) can be sold in one month or even in two months it is to the advantage of the retail

druggist to buy at the lower price. On the other hand, if the purchase of 15 dozen means the purchase of a year's supply of the item, as contrasted with a $1^1/_6$ dozen (a dozen plus free goods) purchase being a month's supply, the advantage of the quantity purchase is considerably clouded. Why?

For the usual city neighborhood drug stores and for most drug stores in cities under 10,000 population, the cost of keeping merchandise in drug stores ready to sell, averages $2^1/_2$ cents a month on every dollar invested in merchandise. This is the share—the rent, heat, light, taxes, insurance, depreciation, etc., chargeable against the individual items in the store. Obviously, those items which remain on hand the longest have the greatest amount of carrying costs charged against them. (A person who stays all summer at a resort hotel pays more board than a person who remains only for one week-end.)

On the gross purchase it is obvious, in the case of a drug store which can sell only $1^1/_4$ dozen of the item in a month that extra carrying costs will be incurred. How much are they? Eleven-twelfths of the purchase will be carried two months. Ten-twelfths for three months, nine-twelfths for four months and so on until the last twelfth of the order, when, if all goes well and nothing untoward happens, as it frequently does, this last twelfth is sold at the end of the twelve months. The total of these extra carrying costs at $2^1/_2$ cents per month per dollar invested in merchandise amounts to $6.36.

As shown earlier in this article, the net cost of the goods bought in quantities directly from the manufacturer is $2.67 a dozen. Bought from the wholesaler in smaller quantities under the terms mentioned, the cost is $3.00 a dozen. The apparent saving in purchase price of 33 cents a dozen, or 11 per cent, is thus more than wiped out by extra carrying costs which add 42 cents a dozen to the average cost of the quantity purchases.

Fortunately for retail druggists not mathematically inclined, it is not necessary to go through these elaborate calculations each time the relative advantages of a quantity discount or free goods offer are considered. Only one question need be answered with respect to the staple, salable and non-perishable merchandise. That is this: Will the quantity proposed to be purchased be sold within one to two months' time? The aim at all times with respect to staple, salable, non-perishable merchandise should be to order a quantity—no larger—*and no smaller*—than can be sold in one to two months' time.

DEMAND FOR PHARMACEUTICAL PRODUCTS IN INDIA.

There is a fair market in India for pharmaceutical products which should increase in the future. The tropical climate of India and the prevailing unsanitary conditions necessitate the use of large quantities of germicides and antiseptics. The prevalence of malarial and dengue fevers creates a large market for quinine, aspirin and other fever preventives. Toxin for vaccination against enteric fever, cholera, smallpox and other diseases are also widely used and many other medicines prepared primarily for use as tonics should find a favorable field.

The United States ranked fifth as a supplier of medicinals to British India during the fiscal year 1928–1929, having provided $583,000 worth. The United Kingdom, Germany, Japan and Italy were the leading suppliers. (Consul R. Y. Jarvis, Calcutta.)

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

President, W. M. Hankins, Daytona, Fla. J. W. Gayle, *Treasurer*, Frankfort, Ky. Chairman of Executive Committee, A. C. Taylor, Washington, D. C. *Secretary*, H. C. Christensen, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Indiana	Montana	Rhode Island
Alaska	Iowa	Nebraska	South Carolina
Arizona	Kansas	Nevada	South Dakota
Arkansas	Kentucky	New Hampshire	Tennessee
Colorado	Louisiana	New Jersey	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming
		Porto Rico	

COURT DECISIONS.

Milk of Magnesia.—The Minnesota Board of Pharmacy has again scored a victory by obtaining the first court decision limiting the legal sale of milk of magnesia to a registered pharmacist, or under his supervision, as recently rendered by Judge White of the Minneapolis Municipal Court. A few years ago, the Minnesota Board won the first decision similarly restricting the sale of aspirin.

Secretary John W. Dargavel caused the arrest of the managers of three Minneapolis chain stores in April for alleged illegal sale of milk of magnesia. The defendants tried to prove that milk of magnesia is a proprietary and not subject to the pharmacy law provisions; the Board proved that milk of magnesia is a U. S. P. product and should be classified as a drug and a medicine. The defendants have until Dec. 20th to appeal to the state Supreme Court. If appealed and upheld, such a decision would be of tremendous benefit in limiting the sale of so-called "home" remedies which are U. S. P. and N. F. preparations.

Sweet Spirit of Nitre and Essence of Peppermint.—On November 5th, the New Jersey Board of Pharmacy brought suit against the proprietor of a so-called patent medicine store, for the sale of Sweet Spirit of Nitre manufactured by Smith, Kline & French Laboratories, Philadelphia, and Essence of Peppermint manufactured by the Fraser Tablet Co., Inc., Brooklyn. The defendant was not a Registered Pharmacist and the sales were made without the supervision of a Registered Pharmacist. Both preparations were labeled with directions for medicinal use, and expert testimony was presented to show that the items sold were medicines.

Following the presentation of the testimony, the Assistant Attorney General, who represented the Board of Pharmacy, moved for a directed verdict in favor of the Board, but the Court stated that the decision as to whether Sweet Spirit of Nitre and Essence of Peppermint are medicines would have to be made by the

jury on the basis of testimony offered. The jury brought in a verdict for the defendant, indicating that it did not consider Sweet Spirit of Nitre and Essence of Peppermint to be medicines.

The Board of Pharmacy took immediate steps to appeal the case to the Supreme Court. A decision by the Supreme Court is not expected for several months. In view of the expert testimony presented and previous decisions of the Supreme Court to the effect that Camphorated Oil and Essence of Peppermint are medicines, within the meaning of the Act, it is expected that the jury decision will be reversed.—R. P. F.

THE PRACTICAL EXAMINATION.

The Kansas Board announces that a new method of handling the Practical Work was inaugurated at the meeting held in Lawrence on November 5th and 6th, which was found very satisfactory.

The second day was devoted entirely to the practical examination. Three members took charge of supervising the actual compounding, and each member graded each candidate on a basis of 5 for neatness, attitude, etc. This gave the candidate a total count of 15 for perfect in this portion of the examination. The other two members took charge of the oral quiz and prescription reading, each member giving a weight of 10 for perfect answers here, or a total of 20 to each candidate as the maximum on this portion of the examination.

In grading the preparations, etc., turned in by the candidates, each member was given one prescription of the five. Thus one member graded all the ointments, another all the capsules, another powders, etc. Each prescription had a weight of 13, or a total of 65 for the five prescriptions. This plus the count of 15 for appearance, etc., and 20 for the oral gives, of course, a total of 100% for the entire practical examination.

Secretary Mac Childs of the Kansas Board Comments as follows: "In the old method, one member graded the entire practical examination and it was an impossibility, in the time allotted him, to make a thorough comparison of the relative values of the candidates and their preparations. In grading the prescriptions now, each member grades one preparation and can line the entire lot on a table, placing the perfect ones at one end and the poorer ones at the other, graduating the line. It fell to my lot to grade an eye ointment of $^1/_2$ grain yellow oxide of mercury; you would have been surprised at the range in colors and strengths that were handed in—they varied all the way from a deep orange to an almost colorless ointment, and the analysis revealed that they contained from 30 grains to less than $^1/_{20}$th of a grain of yellow oxide of mercury. The granules of yellow oxide of mercury were plainly visible in many of the ointments."

The advantages claimed for the system are that each candidate is graded by each board member on all of his work and that uniformity in grading is accomplished as each member grades one prescription straight through. After finishing the grading, it was found that the practical grades were lower than usual, but that they corresponded more closely to the candidate's standing in the written work, and the method was considered excellent and fair.

PERSONALS.

Fred L. Vilas, a member of the South Dakota Board of Pharmacy, is this year celebrating the fiftieth anniversary of Vilas Drug Stores in Pierre, an outgrowth of the former Black Hawk Medicine Co. A most interesting anniversary booklet has been published by Mr. Vilas giving the history of the organization and an outline of the service it has rendered the community during the fifty years of its existence.

John W. Dargavel, secretary of the Minnesota Board of Pharmacy, has a hobby. He operated a miniature golf course in Minneapolis last summer. In addition to his many Board duties, he is also *first vice-president* of the National Association of Retail Druggists and *second vice-president* of the AMERICAN PHARMACEUTICAL ASSOCIATION.

STATE BOARD NEWS.

Alabama.—The Legislative Committee is busy working on the revision of the pharmacy law, the object being to strengthen the enforcement powers. Amendments are to be introduced when the legislature convenes in January 1931.

Arizona.—Secretary A. L. Phelps writes that owing to the flood of inquiries as a result of the publicity given to the shortage of pharmacists in Arizona, there is now an oversupply. Quoting him: "While business has been fairly good here, it will not support the number of persons who have already come, and I am advising those who write that they should not come unless they are able to support themselves through a period of idleness of at least two months."

H. Boyd Laird of Globe was recently elected *President* of the Arizona Board to succeed Dr. J. A. Dines, who retired at the age of 86. Fred W. Moore of Flagstaff was elected *Vice-President.*

The Board raised the passing grades for assistant pharmacists to a general average of 75% with not less than 60 in any one subject, effective immediately. This is the same standard as required for licentiates in pharmacy.

Twenty-seven pharmacists from other states were registered by reciprocity at the October meeting of the Board. Fifty-seven applicants took the regular examination, and one applicant took the assistant examination.

Secretary Phelps will gladly furnish copies of the state association bulletin to any who desire it.

Colorado.—An analysis of the results of the September examination shows that 42 out of 81 candidates passed. Of these, 26 were given R.Ph. certificates, and 16 won assistant licenses. Reciprocity was extended to one applicant on the basis of a Missouri license. An examination was held in Denver on December 12 and 13, results of which will be announced later.

Indiana.—Twenty-four Indiana certificates were issued as a result of the October examinations, three being assistant licenses. Two reciprocal licenses were also issued, one to a Pennsylvania applicant and another to an Illinois pharmacist.

Iowa.—The Pharmacy Board held examinations for twelve candidates on November 1 and 14—the smallest class on record. Reciprocal licenses were issued to an Illinois and an Oklahoma applicant.

Kansas.—Frank Milne, president of the Kansas Board, whose term expired recently has been reappointed. He was serving the unexpired term of P. H. Klinkenberg, and was therefore eligible for reappointment.

Maine.—Amendment of the pharmacy law is contemplated at the next session of the legislature, and a committee is working on amendments. An increase in the examination fee is contemplated; also the college prerequisite. Albert H. Wheeler of Massachusetts was recently granted a reciprocal license.

Maryland.—The Maryland Board of Pharmacy presented a photograph of the late J. Fuller Frames, president of the Maryland Board for fifteen years, to the University of Maryland School of Pharmacy at a meeting of the A. PH. A. Branch held on November 20. Local, state and national associations were represented, A. C. Taylor of Washington, D. C., representing the N. A. B. P. (For Frames' obituary, see page 893, August 1930, JOURNAL.)

Michigan.—G. M. Benedict, Director of Drugs and Drug Stores, reports that an examination was held at Grand Rapids, November 18, 19 and 20. Fifty-four applicants took the Registered Pharmacist examination and twenty-seven the assistant.

Missouri.—An examination meeting is announced for January 12, 1931, at Macon, Mo. There have been no changes in the Board personnel. An Illinois registrant was granted a reciprocal license in November.

Montana.—Eight new pharmacists have been added to the roster as the result of the October examinations.

President John W. Seiden of Lewistown is acting as Chairman of the Legislative Committee, which is drafting amendments to the pharmacy law. Details will be given later.

The personnel of the Board remains unchanged, Alex F. Peterson of Missoula being reappointed by the governor to succeed himself.

The Board of Pharmacy is acting as a special committee on the new pharmacy school building to be erected at the University of Montana at Missoula. A meeting will be held shortly to check over plans and specifications; the estimated cost is $200,000.

The secretary of the Board, J. A. Riedel, is making a special drive among the pharmacists of the state asking support of the Capper-Kelly bill.

North Dakota.—Secretary Costello reports that Paul W. O'Harra of South Dakota was registered by reciprocity at the November meeting.

Ohio.—The Ohio Board recently announced that 37 out of 64 applicants taking the November examination were successful.

An applicant from West Virginia and another from Indiana were granted reciprocal licenses.

The highest grade made in the examination was 95.1, by Valentine Yost, a graduate of the Cincinnati College of Pharmacy, class of 1930.

The Supreme Court recently denied the application of George A. Gafford for rehearing, thus making the action of the Supreme Court sustaining the Ohio Board in denying a license by reciprocity to one whose previous license had been revoked for violation, final.

A. L. Flandermeyer of Cleveland was elected *President* of the Board; F. H. King, of Delphos, *Vice-President;* and M. N. Ford, of Columbus, was reëlected *Secretary.*

The final examination will be held in Columbus January 13 and 14.

Oregon.—The question of the consolidation of professional boards in the cabinet form of government was presented to the voters in Oregon at the recent election and defeated. The N. A. B. P. supplied such data as it had available on the results of consolidation in an effort to block the movement. With few exceptions, consolidations have resulted in a lessening of the professional morale. Oregon is to be congratulated on its successful campaign against consolidation of professional examining boards.

Pennsylvania.—At the October 1930 examinations given by the Board, 139 applicants took the pharmacist examination and 168 applicants took the assistant examination. There were 84 successful pharmacist applicants and 109 successful assistant pharmacist applicants.

The next examinations will be held in Philadelphia and Pittsburgh colleges of pharmacy on January 8, 9, 10, 1931.

South Carolina.—The results of the Board examination held in Myrtle Beach in July at the time of the state association meeting show that 27 of the 40 applicants were successful.

The November examinations were held at Newberry on November 19 and 20. Twenty-one applicants presented themselves, eight being successful.

Utah.—Six applicants were examined at a recent examination but only one passed. Six pharmacists from other states were registered by reciprocity. Enforcement work continues and five arrests were recently made for violation of the pharmacy law.

West Virginia.—Roy B. Cook of Charleston advises that a legislative campaign is being planned. Among the proposed changes are: (1) The members of the Board to be selected from a list submitted by the state association to the governor. (2) All stores to be licensed by Board. (3) No store within two miles of a drug store shall sell patent medicines.

The 79th Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Miami, Fla., during the week of July 28th, 1931.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

The following paper by Professor Zufall is a continuation of the discussion on Materia Medica which appeared in the last issue of the JOURNAL.

The address of Dean Rudd, appearing in the *Purdue Pharmacist*, deserves, I believe, a wider circulation because of the many helpful things for students of pharmacy contained therein.—C. B. JORDAN, *Editor*.

SOME WAYS OF STIMULATING THE STUDENT'S INTEREST IN BOTANY.*

BY C. J. ZUFALL.

This paper is based upon the assumption that a student learns a great deal more when he is interested in the subject being taught. It is also assumed that it is the duty of every teacher to make every possible effort to arouse this interest in the student.

In teaching Botany, the question of proper material for laboratory study is an important one. It is evident that the material must be suitable to the occasion, but the interest of the student could be aroused decidedly in a great many cases by the use of "crude drugs."

This plan is, of course, a valuable one in teaching Pharmaceutical Botany, but even the student of pure science, or the high school student would be more interested in such a study if he knew that the material under observation had some curative property.

I think I am safe in saying that many students of botany finish their four-year college course without the realization that there is a close relation between botany and medicine. How many graduates in botany know that the latex of a seed pod relieves more pain than any other substance in the world? Or how many have the fact brought to their attention that the leaf of the pretty foxglove is the most valuable heart tonic known? How many consider the danger to animals and children of the poisonous seeds of the common castor bean, although, from the same seed, our harmless castor oil is expressed?

These crude drugs, of course, are available to schools of pharmacy, but other schools may secure them at a small cost from a wholesale drug house. This material will be found in the dry state, but it is remarkable what can be obtained from it.

Beginning with the lowest forms of plant life we could very well use purified siliceous earth. The beginner in microscopy finds this material easy to mount and there is no difficulty in finding what is wanted. The variety of peculiar forms of diatom skeletons makes the study attractive and there isn't much trouble in getting satisfactory drawings. Considerable emphasis should be placed upon the point of getting the student to feel that his first attempt in microscopy has been a success. In the same laboratory period the living diatoms should be studied. If time permits of more extended study of diatoms, Agar could be examined for the circular skeletons of *Arachnoidiscus*, which are nearly always present in this substance, and make an interesting study.

* Purdue University School of Pharmacy.

For a study of the larger algae we have Chondrus and Fucus, both of which give the inland student a good idea of what seaweeds are like.

To represent the fungi we have on our shelves three drugs—the White Agaric, Ergot and Yeast. Ergot illustrates the means by which this parasitic fungus lives through the adverse conditions of winter. In the study of the growth of yeast the student learns how alcohol is produced as the metabolic bi-product of the plant.

Even the lichens have representation in pharmacy in the form of Cetraria.

The Bryophytes are not to be omitted, because a valuable, though not a potent product is found in the form of sphagnum moss. When cleaned and dried this plant forms a very good absorbent dressing which costs less and absorbs much more moisture than absorbent cotton. The reason why this plant is a valuable absorbent could be made the basis of a study in Histology. Such a study would reveal the fact that the larger part of the leaves of the plant is composed of dead, empty cells with porous walls. Such a structure makes possible the absorption and retention of large quantities of water.

From the Pteridophytes we get two important drugs, namely, Lycopodium and Aspidium. The former consists of the spores of *Lycopodium clavatum* and can be used in the study of the asexual spores of the vascular cryptogams. Their peculiar shape and reticulate surface make interesting microscopic studies for the beginner in microscopy.

The Male Fern plant makes very good material for the study of the histology of the ferns. Schools of pharmacy should all have the two common species of Dryopteris growing in their gardens, from which the material could be obtained.

For studies of flowering plants we find many crude drugs of considerable value. For the study of leaves the following drugs are found in almost the whole state and suitable for class work: Buchu, Eucalyptus, Uva Ursi, Damiana, Coltsfoot, Pilocarpus, Senna, Grindelia, Peppermint and Thyme. An examination of these reveal the fact that they possess a wide diversity of color, texture, shape, margins, hairs, oil glands and other surface markings. There is Buchu with an oil gland at the base of each tooth and its pellucid punctate surface; there is Coltsfoot with its under-surface made white by the innumerable long hairs; there is Eucalyptus, with the unusual shape of a scythe, an occasional one from a young branch being symmetrical, showing a peculiarity exhibited by some plants of producing differently shaped leaves on branches of different ages. Grindelia leaves are so thickly covered with a resinous exudation that the plant is called "gum-plant." With a hand lens the student can easily find the glandular hairs on the Peppermint leaves and stems. These are the structures which yield peppermint oil. Menthol, known to most people, is obtained from this peppermint oil.

For a study of leaf-buds, the pharmacist has Balm of Gilead buds which show so decidedly the way in which Nature sometimes protects the tender organs by coating them with a water-proof oleoresin.

When we come to the study of carnivorous plants we may take from our shelf the drug Drosera or sundew, which is known to all of you and which is used by some physicians.

For the study of flowers and parts of flowers we may find several drugs on our shelves which, though dry, are whole and in a good state of preservation. Arnica

and Matricaria are excellent representatives of the composite flowers, showing the characteristic ray and disc florets. The akenes of Arnica may be used in a study of the pappus which, in this case, consists of multiserriate hairs. If these flowers, as found in the drug store, are soaked in warm water for a few minutes, they are as good as fresh material.

Mullein flowers may be used for a study of adhesion of parts of a flower. This drug consists of the corolla with the stamens adhering to it. The hairs on the inside of this corolla are of the peculiar stellate variety. This flower also shows the peculiarity of having two kinds of stamens, three short, hairy ones and two longer ones with few hairs.

Spanish Saffron may be used in studying stigmas. In Hoarhound and Pennyroyal the persistent calyces are always found and may be used in the study of the calyx. They are quite rigid and easily handled without breaking. Pennyroyal is also of interest because the exterior is thickly dotted with glandular hairs.

Orange flowers as found on our shelves are rigid and the parts not broken up, so that, after soaking for a short time, they form excellent material for the study of flowers.

For representative fruits one does not have to search long among crude drugs. The following list shows what one may find: Cubeb and Pepper are drupes; Malt is a caryopsis; Capsicum and Colocynth are berries; Anise, Caraway, Fennel, Coriander and Parsley are cremocarps; Poppy fruit is a capsule.

For a study of seeds what greater variety could one find than in Pepo, Mustard, Cardamom, Colchicum, Linseed, Myristica, Nux Vomica and Strophanthus.

For a study of digestion in plants, the preparation of malt makes an interesting study. By means of the amylolytic enzyme, diastase, furnished by the seed itself, the insoluble starch is converted into sugar and dextrin. Therefore, the malt contains two medicinal substances, namely, a predigested food and diastase which is an aid to digestion.

Another interesting phenomenon is the formation of the amylolytic enzyme, "Takadiastase," by the growth of the mold Aspergillus.

For a study of the microscopic structure of monocotyledon stems we use the drug Triticum. For the study of dicotyledon stems we use Dulcamara.

ADDRESS BEFORE THE STUDENTS OF PURDUE UNIVERSITY SCHOOL OF PHARMACY.*

W. F. RUDD.**

Thirty years is a long time. It represents in the lives of most men and women about all the time there is for genuinely constructive work. It is longer than you have lived. Those of us who have been in college teaching for such a period have seen thirty groups of young men and women take up their chosen work, complete it or fall by the wayside, and then go out into the world to meet the opportunities and responsibilities of business, home, community, church and state.

Thirty years of such experience and contacts should have given us older men

* From the October issue of the *Purdue Pharmacist.*

** Dean of Pharmacy at the Medical College of Virginia.

ripened judgments, broader sympathies, truer values of men, manners, motives and morals. It also gives most teachers an inordinate tendency to preach too much to the younger generation. I must plead guilty to the latter, although I try to solace myself with the idea that it is not preaching down to my students, but rather the expression of a vital urge to help them in ways that only age and experience can. Some of them hear and heed; others—well, you know. You, your teachers, your school is just such a cross section as is mine or any other college group.

Having thus been a keenly interested observer of thirty groups of freshmen and their subsequent careers, I have tried honestly to evaluate the influences that have been most dominant in shaping these careers. I wonder how you young men with your eyes toward the future would evaluate these factors. I wonder what you think is the most important, the next most important, and so on, step that you will take in life. Answers from this group would make a tremendously interesting study. I suspect that you yourselves would be surprised at your own answers if you saw them in writing. Well, certainly age and youth would not agree on the relative importance of all of these. This is as it should be. Youth and age should not see the world through the same glasses. You must and will live your own lives. A teacher who would have it otherwise is unwise. However, there are manifestly certain fundamentals on which neither the enthusiasm of youth nor the conservatism of age would put a very different valuation. I won't list these. You can do it as well as I can. I leave such observations in your hands. There are, however, a few facts gleaned through the years that I would like to talk to you about.

I am jealous—extremely so—of the good name of pharmacy and of pharmacists. Unfortunately, right now we are the butt of the jokester. We may as well face it just as it is. The pharmacist's activities are so diversified that he just naturally falls in the clutches of fun-makers. This produces a sort of complex that is good neither for the pharmacist nor for the public he serves.

The happy occasion that you students of Purdue are celebrating to-day is the best possible antidote for the harmful influence of this complex. A year or two ago this institution, along with others in your state, came into the full stature of a college course—four years—no less—in pharmacy. Prior to that time you carried the stigma of a short course. The engineer, the dentist and even the veterinarian thought of you as a sort of anachronism in university circles. To-day you come into your new home the equal of any on the campus. These two major events —both within the experience of seniors in your midst—must inevitably beget within every one of you a professional *esprit de corps* that will make you immune to many of the things that have weakened the morale of pharmacists. A consciousness that you are to go out into the world with your training rooted in those same fundamental sciences and cultural subjects that are the bases of all sound education will have a profound influence upon you personally and upon your work in pharmacy. Your house is now builded on a rock—so builded that it will stand the shafts of criticism and the windy words of the wiseacres.

Purdue is showing us the way, and in just two more years the last vestiges of the short courses in pharmacy will have disappeared and with it much that has struck at our very vitals. A new day is just in the offing. Hats off to you of Purdue who have come into your own years ahead of many of us!

There are just two more matters that I venture to discuss with you, and both of them are acutely personal. Pharmacy has accumulated more than its proper share of riff-raff men who are nothing more nor less than pharmaceutical gypsies—working here, there and everywhere, dissipated, unreliable, irresolute, sometimes even a menace. Time alone will slough these old ones off. Is it too much to hope that the new day in educational opportunity for pharmacy will greatly limit the recruits to this unfortunate army that is now such an incubus to our profession? Won't you think well on this?

Earlier in this paper I ventured to ask what single thing would make the most profound impression upon your life. I can't close without asking it again and then suggesting an answer—not dogmatically, but open-mindedly. I doubt that all of you will agree with my conclusion, but aside from my own conviction about it, I had an experience recently that confirmed my rather strong suspicion of what the answer was—one of them, anyway.

In talking to a group of students in a fraternity meeting this same inquiry was raised, and I had the temerity to suggest that, more than they dreamed of, their future was being shaped by the girls they visited, danced with, became engaged to and would finally marry. And then rather boldly I asked them if they had ever really reasoned out deliberately just what sort of girl they would want to bear them their children. Little did I suspect how seriously these young men—seemingly so casual about many things—would take this question. Later, they suggested that it be discussed with the whole class—and it was—with the same general reaction. I pass this on to you for what it is worth. Your mother will tell you that the woman you marry will make or mar you.

Finally, why do I make this the chief topic of this talk to you? I do it because I have seen more failures among professional men from unwise marriages than from any other single cause. Among the advantages which the opportunities of college life and college training give is entrée into homes that many of us would not have otherwise. Your range of choice of friends is multiplied many times because of it. This does two things: *first*, it raises the standard of the type of woman that will meet your own needs as you grow into a life of usefulness and responsibility. *Second*, as an educated man, the world has a right to expect you to contribute wisely and well to the permanency of that most important and sacred of all human institutions—the home and family unit. Of all the choices you must make in life, I trust the choice of the mother of your children will be wisely made.

It is stated that as a result of a conference between Dr. Victor L. Heiser of the Rockefeller Foundation and Mr. Kenzo Adachi, Minister of the Department of Home Affairs, Japan, the latter will undertake to build institutions for the promotion of public health. It is said that the Rockefeller Foundation is in favor of a school for public health in Japan, as established by the Foundation in Poland and Czechoslovakia. The object of this school is to teach students the administration of public health, and the centre is to be the school of medicine; however, it is expected that a course in pharmacy will also be established, for it is impossible to separate pharmacy from medicine. Further conferences and negotiations are necessary before final conclusions are reached.

The record of the investigation of the Foods and Drugs Administration conducted last Spring by the Senate Committee on Agriculture and Forestry, has been printed.

A colormetric test for ergot alkaloids, written by Maurice I. Smith, senior pharmacologist, Hygienic Laboratory, U. S. Public Health Service is being distributed by the U. S. Treasury Department.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meetings of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

The first meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION for 1930–1931 was held at the Emerson Hotel on October 31, 1930, President Frank L. Black presiding.

The activities of the national pharmaceutical associations in their various annual conventions were reviewed and discussed. Reports were given by the following:

Aquilla Jackson, AMERICAN PHARMACEUTICAL ASSOCIATION

Andrew G. DuMez, U. S. Pharmacopœial Convention

Lawrence S. Williams, National Association Retail Druggists

H. H. Robinson, National Wholesale Druggists' Association

R. E. L. Williamson, Federal Wholesale Druggists' Association

R. L. Swain, National Association of Boards of Pharmacy

Glenn L. Jenkins, American Association of Colleges of Pharmacy.

B. OLIVE COLE, *Secretary-Treasurer.*

NOVEMBER.

The November meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, which was held at the School of Pharmacy of the University of Maryland on Nov. 20, 1930, was arranged as a memorial to the late J. Fuller Frames.

President Frank L. Black presided and representatives of the professional, charitable and religious organizations with which Mr. Frames was associated participated in the program.

A life-like portrait of Mr. Frames was presented to the School of Pharmacy of the University of Maryland by Dr. R. L. Swain for the Maryland Board of Pharmacy. Dean A. G. DuMez accepted the portrait for the School of Pharmacy. Mr. Frames was a member of the Maryland Board of Pharmacy from 1911 until his resignation in May 1930, and held the responsible positions of treasurer, president and examiner in practical pharmacy. Mr. Frames was elected a member of the Maryland College of Pharmacy in 1885, served as a member of the Board of Examiners from 1892 to 1897, and by virtue of holding that office served also as a member of the Board of Trustees.

The following spoke for the various organizations indicated: Lloyd N. Richardson, for the Maryland Board of Pharmacy; E. F. Kelly, for the Maryland Pharmaceutical Association; S. Y. Harris, for the Baltimore Retail Druggists' Association; Wm. J. Lowry for the Alumni Association of the School of Pharmacy; Charles Morgan, for the Baltimore Veteran Druggists' Association; Dr. A. D. McConachie, for the Northeastern Dispensary; A. C. Taylor, for the National Association of Boards of Pharmacy; E. G. Eberle, for the AMERICAN PHARMACEUTICAL ASSOCIATION; R. E. L. Williamson, for the Federal Wholesale Druggists' Association; Chas. L. Meyer, for the National Association of Retail Druggists; J. Fletcher Apsey for the Seventh Baptist Church.

In addition to the above representatives, the family and many friends of Mr. Frames attended the meeting. It is impossible to adequately summarize the many eloquent tributes paid to the life and work of this true pharmacist.

B. OLIVE COLE, *Secretary-Treasurer.*

CHICAGO.

The 192nd meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the University of Illinois School of Pharmacy on the evening of Nov. 11th at 8:00 P.M., President Hynes presiding. There was a record attendance, there being between 150 and 175 present, 25% of whom were women.

The meeting was opened by a summary of the contents of the last issue of the JOURNAL by Herbert Emig. This is a regular part of the program of the Chicago Branch, Mr. Emig giving a sketch of the preceding JOURNAL at each meeting.

Following this, the speaker of the evening, Professor F. C. Koch, Chairman of the Department of Physiological Chemistry and Pharmacology of the University of Chicago, was introduced. He gave a splendid talk of about an hour's length on "The Sex Hormones," and from the interest taken by the group, his address could have been much longer.

"The first statement to make about sex hormones is that at the present time they are not of any therapeutic value to man. Two of the sex hormones, one obtained from the ovary and perhaps other tissues and the other from the testes will be discussed. All are familiar with the fact that the removal of the ovaries or testes brings about certain changes which in young animals may be altered by transplanting of organs. The gonads yield an internal secretion which influences the secondary sex characteristics markedly. The evidence of transplanting is an old story. However, trying to extract the active substance from organs and trying to replace their activity by either injection or by mouth is quite a different story. The feeding of such materials has been unsuccessful in experiment although there are many claims by proprietary manufacturers that their preparations are active when given by mouth, especially those representing the ovary. This has not been confirmed by animal experiment.

"*Ovarian Hormone.*—A fat-like substance extracted from the ovary, when injected into rabbits affects the size of the uterus. When this substance was first extracted and claims made for it, some denied the claims, but subsequent tests by others have confirmed it. Assaying development—in hormone chemistry the detection must be based on biological responses. Adrenalin and like substances do not depend on this as they may be separated rapidly and in a pure condition by the aid of a color reaction. Another special routine must be used in the case of enzymes. In hormone assaying difficulties are also met with due to the variability of animals, and this may give seemingly irregular results. Nevertheless a relative simple method has been devised. A castrated female mouse or rat is injected with the substance and from 24–48 hours vaginal smears are made and the type of cells examined. If the product is active the simple type of cells such as leucocytes are replaced by epithelial cells. Fifty animals must be used for experiment, and 50% of these should react with a minimum dose of the product whose activity is being sought. By means of this test a rat unit or a mouse unit has been established. Qualitatively and quantitatively this same substance is judged by biological reactions, solubility, etc. These hormones are obtained from the ovary, blood of pregnant animals and in large quantities from the urine of pregnant animals, especially women, but cannot be obtained from the blood of males or non-pregnant females. This finding is important in the connection with hormones in crystalline form. The material is acidified and extracted in a continuous extraction apparatus with benzin or ether. The quantity in pregnant urine is very large when compared to that found in the ovary, and inasmuch as it is also richer, urine is a more convenient source. An important step in the perfection of the material and an important property that was missed for years by earnest workers is the fact that it is also soluble in NaOH solution. The method of obtaining it is comparatively easy—fractionation and sodium hydroxide, then acidified, etc., similar to the shaking out process as used with alkaloids. The material thus obtained leaves a crude oil upon evaporation which is distilled under very low pressure. At a certain point one may obtain crystals. Doisy, of St. Louis University, Lacquer of Amsterdam, Butenadt and an Englishman named Marrian have attempted to determine its formula. The latter did not use distillation, but fractional crystallization

of solids to obtain his material on which he carried out his work. Doisy gives it the formula of $C_{13}H_{22}O_3$; Butenadt $C_{17}H_{22}O_2$; Marrian $C_{18}H_{24}O_3$. The difference between the formulas of Butenadt and Marrian shows that one seems to be the hydrate of the other, the difference being one molecule of water. All agree that it has a molecular weight of the order 266–288 and that it contains from four to six carbon rings. It appears to contain two alcohol groups according to Doisy, three alcohol groups according to Marrian and one alcohol group and a ketone group according to Butenadt. It is obtainable from the non-saponifiable material of tissues. The question comes up, 'Is it related to cholesterol?' No such reactions have been observed by Doisy, but Marrian has found some spherol reaction.

"In rat units, according to Doisy, one Gm. of material is equal to 3,000,000 and Butenadt estimates the same quantity to yield 7,000,000 to 8,000,000 mouse-units. There is no difference in behavior of the crude oil or crystal material. The action is the same with dogs—heat is produced by injection. In one particular case at the University of Chicago, Gustafson found that estres was produced in a castrated bitch and also hypertrophy of the mammary glands, ample normal milk being produced to nurse two puppies. The 'mother' also defended the pups as if she were their real mother. Another observance of the physiological action is in the changing of the feathers of a capon by injection with hormones, a female plumage being produced when injection with female hormone is made. Daily injection with this hormone produces areas of normal female feathers, but if injection is not made daily the dark color of the normal cockerel feather returns.

"Even though crude oil was injected carefully, no satisfactory, consistent results have been obtained. Thus, those experimenters do not hold out much hope for the successful use of the material for humans. Understand, those studying this do not take the view of beginners that estres and menstruation are the same.

"*Testicular Extract.*—The first extract made from dog and guinea-pig testicles was prepared by an old man who actually injected the extract into himself, claiming astounding results. He was strengthened, could work harder, walk faster and farther, etc. Since his experiment, others have tried, but could not get the same results, so the opinion is that suggestion or idiosyncrasy entered into his case. His experiment was not considered scientific, for he alone was the subject on which his trial was made. On cut muscles it was found, however, that an injection did prolong their time in action and fatigue set in at a later time. The workers used a commercial preparation, but did not use a control nor did they use similarly made extracts from other tissues. Many attempts were made, the failures not published, to demonstrate some positive method showing the ability to extract a substance from the testes to replace loss. The first clear-cut evidence of such an extract showed in the treatment of a capon. When injected, it grew a large comb and wattles and they had the natural color of those of a cockerel. This started to evidence itself on the second day and when it was discontinued the capon reverted to its natural type. A capon standard was set by this experiment. Marked growth was noticed for the first five days. Then the growth was much slower even though larger doses were given. A minimum dose of 30 mg. per bird was found to give results and a five-day period was found to be a fair time to obtain this quantitative dosage. The error was found to be about 30% which is small enough to allow the purification to be carried to a point. Finally, of this purified extract, it was found that 0.01 mg. per day for five days would show a change in appearance of the comb. It was also found that when the same quantities were given to birds, some kept indoors and some outdoors, the results were different, indicating that light was a factor in the effect the preparation had on the birds. Investigation showed that the birds kept indoors responded more quickly than those kept outdoors, the light retarding the comb growth. (The detailed method for obtaining this information was shown by charts on lantern slides.)

"The male hormone is not soluble in NaOH solution and as the female hormone is soluble, they may be separated by use of this solution. The yield of male hormone decreases as the animal gets older, embryonic bulls yielding a high percentage, normal bulls a lesser amount and old bulls still a smaller quantity."

Slides were shown giving photographs of the cells of rats during twenty-day treatment with hormones. First the normal cells were shown, then the shrunken cells after castration, and lastly the cells revived again to their normal size after injection. Capons, rats,

guinea-pigs and mice all show parallel results and from physiological evidence one may show that the rejuvenated cells contain terpenzyme, a substance which is not in the glands of the plain castrated animals.

The speaker discussed further phases of the experimental work. He brought out facts relative to certain market preparations in which the doses in order to be effective would require the concentration of very large quantities of material. The statement was made relative to doses of some of these products, that a capon had been given nine times the dose as designated for man, yet no comb growth was noticed.

This work reported has been coöperated by work at the University of Chicago in experiments during the last four or five years. Dr. McGee has successfully fractionated the material to a point where injections of small quantities representing large quantities of material has been accomplished. Mr. Gallagher Dr. Dahm, Dr. Moore and others have spent a great deal of time in investigation and research to produce this information.

Dr. Fantus expressed his appreciation for the information given and for the wonderful way it was presented to the Chicago Branch. Questions were asked by him and by others and following the announcement of the next meeting of the Branch on Friday, December 12th, a social one given by the girls of the University of Illinois School of Pharmacy, a rising vote of thanks was given Professor Koch. LEWIS E. MARTIN, *Secretary.*

DETROIT.

The November meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Thursday Evening, November 13th, in the Y. M. C. A. Building. Dinner preceded the meeting.

The meeting was called to order by President John H. Webster. The minutes of the Secretary were read and approved.

President Webster then introduced the speaker of the evening, Dr. Elwood A. Sharp, Director of the Department of Experimental Medicine of Parke, Davis & Company, who gave a most interesting talk illustrated by lantern slides on the "New Medicines in the Treatment of Anæmia." He pointed out the racial differences in pernicious anæmia, the various forms and symptoms. His slides illustrated the changes occurring in the red blood cells and showed not only an increase in number but also the various "health stages."

The speaker explained that previous to the Liver Extract and Stomach Tissue Treatment, arsenic was wholly depended upon to produce the desired effect. While anæmic substances are used with proven success, as yet the active principles of these substances have not been isolated.

A most interesting discussion followed, which brought out many points of value. Dr. Sharp testified to the marked increase in anæmic patients due to the financial conditions which preclude some patients from buying the extracts.

After a vote of thanks was given the speaker, for his most instructive presentation, the meeting adjourned.

BERNARD A. BIALK, *Secretary.*

NEW YORK.

The November meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, which had been scheduled as "State Board of Pharmacy Night," was held at the College of Pharmacy, Columbia University, on Monday the 10th, the chair being taken by the president, Robert R. Gerstner. About 77 members were present, of whom 25 attended the Get-Together-Dinner which preceded the meeting.

The minutes of the October meeting were read; Mr. H. W. Ambruster questioned the accuracy of the minutes as to whether or not a motion had been put to the meeting in regard to the action taken on his resolution; Dr. H. V. Arny stated that he had put the motion to the meeting, and Dr. Jacob Diner rose to say that he had been the seconder. Mr. Ambruster then put the question of the accuracy of the minutes to the meeting which approved them unanimously. The president read a telegram he had received from Secretary Kelly stating that Mr. Ambruster's resolution was being submitted in a Council Letter and that the New York Branch would be advised of the decision later.

Chairman Lehman, of the Committee on Education and Legislation, reported that the New York State Pharmaceutical Association, with the coöperation of the New York Pharmaceutical Conference, was arranging for radio programs in the interest of pharmacy.

Dr. Schaefer, reporting for the Committee on Student Membership, submitted applications from 162 students of the College of

Pharmacy, Columbia University, for approval; Dr. Diner on behalf of Prof. Canis of the Fordham College of Pharmacy presented 9 applications from Fordham students. Secretary Kassner submitted the names of John J. Nichols and Herman J. Amsterdam for full membership in the Branch and the applications of Maurice Dunay, Eli Stevens and Israel Sherman for membership in the Parent Organization. The foregoing applications were all approved by the meeting.

Under the heading of New Business, Mr. Ambruster stated that he had been informed that his resolution at the previous meeting had been handled in accordance with Article III of Chapter VII of the By-Laws of the A. PH. A.; he then read this Article and questioned the treatment of his resolution under it. Dr. H. V. Arny pointed out that Mr. Ambruster's resolution could have been (1) accepted by the meeting or (2) rejected by the meeting or (3) referred to the Council of the parent body, and that he had made a motion in accordance with the last of these methods of treatment. Dr. Schaefer rose to speak and after a few remarks, pointed out that under the By-Laws of the New York Branch the Scientific Section must start its proceedings at 9:00 P.M. As this hour had arrived, a motion was made and carried to proceed with the program.

Chairman Dyer, of the Committee on the Progress of Pharmacy, read abstracts of recent papers on the action of heat on acacia mucilages, a comparison of the poisonous principles from the various kinds of pyrethrums, and the stabilization of lard.

President Gerstner introduced President H. C. Christensen, of the AMERICAN PHARMACEUTICAL ASSOCIATION and Secretary of the National Association Boards of Pharmacy, who was on a visit to New York and was honoring the Branch meeting with his presence. President Christensen, in his opening remarks, expressed his pleasure at being able to attend a meeting of the Branch, and said that he wanted to congratulate it on its splendid work which was widely known. He noted a distinct trend everywhere toward the professional side of pharmacy; for example, this year every State Association, without a single exception, had presented one to three papers on scientific pharmacy at its meeting. He himself was a staunch believer in the future of pharmacy, and pointed out with satisfaction that whereas in 1914—only New York State and Pennsylvania required graduation from a college of pharmacy before taking the State Board Examination, now 36 states required graduation from a college of pharmacy giving a three-year course; longer courses gave more opportunity for a better training on the professional side; moreover everyone would agree that a successful pharmacist must be trained in business in order to succeed. He concluded by saying that he hoped that all present would try to attend the A. PH. A. meeting at Miami in July 1931.

President Gerstner, on behalf of the meeting, thanked President Christensen for coming and asked him to convey to the Officers of the Parent Organization the kindest regards of the Branch.

Secretary George W. Mather, of the Board of Pharmacy of the State of New York, was now introduced by the president as one of the speakers of the evening. He began by explaining the new Annual Registration of Pharmacists for the State of New York which comes into operation on January 1, 1931, and stated that each pharmacist would receive a registration form and instructions for filling out the same; he pointed out that under the State Law it was not mandatory for registered pharmacists who were not actively engaged in the practice of pharmacy to register, but that it was advisable. He spoke of some of the predicaments of pharmacy at the present time, for example, the lack of interest in Association work shown by outstanding men, also lack of confidence or distrust in the pharmacist shown by his medical associates, this being largely due to the leaving of stores in charge of incompetent men, and the compounding of prescriptions by unlicensed persons. Mr. Mather stated that for the past 5 years, an average of 851 persons had been licensed per year in New York State, while for the same period an average of 201 new pharmacies had been opened; to man the new stores properly 402 licensed men are required, hence there is a surplus of 449 licensed men each year and these in a great measure are without employment; for a recent 10 months' period, 230 new stores were opened and this fact lends color to the statement that "the more idle pharmacists there are, the greater is the increase in the number of stores." He mentioned the reasons for the appearance of many pharmacists before the Violation's Committee, for example, the overbuying of perishable merchandise

which deteriorates, or the buying of materials from firms not having a high standard of pharmaceutical products. He said he had received hundreds of complaints regarding the sale of Mercurochrome by 10 Cent Stores at 10 cents a bottle; pharmacists stated that they could not purchase it wholesale at that price; he showed that pharmacists could make and put up their own stock in gallon quantities for 5 cents per bottle and that this was the solution of the problem. Mr. Mather pointed out that drugs and medicines on the order of prescriptions are being made by manufacturing firms without the supervision of a licensed pharmacist, and that the Board of Pharmacy has no jurisdiction over them; this, he felt, was not as it should be. He spoke of the percentages of failures among the candidates before the State Board Examinations, citing figures for different colleges and stating that Commercial Pharmacy is the subject in which most failures occur. Mr. Mather concluded his remarks by calling attention to the fact that the Board of Pharmacy was conducting visits to non-pharmaceutical stores in an effort to limit the sale of Aspirin, Milk of Magnesia, etc., to licensed pharmacists.

The president then called upon Secretary Robert P. Fischelis, of the Board of Pharmacy of the State of New Jersey, to deliver his address on "Problems of a Pharmacy Board Secretary."

Dr. Fischelis first pointed out that the defect of every Pharmacy Act is that, while standards are set for official remedies which must be controlled by the Board, there are none for proprietary articles which are not controlled by the Board, and whose formulas may change from day to day. He outlined his experiences in regard to the annual registration of pharmacists which has been carried out for many years in the State of New Jersey. He stated that it was a violation of the Pharmacy Act to sell medicines or to supervise their sale unless annually registered, and that if a man allowed his license to lapse for several years he would have to appear for an oral examination to satisfy the Board as to his competency to practice pharmacy. He spoke of the sale of Camphorated Oil, Essence of Peppermint, etc., by non-pharmaceutical stores and said that the Board would have to take up each item separately with the Supreme Court in order that it may be ruled as a medicine coming within the province of the Board of Pharmacy. He spoke at great length of the Board Examinations, referring to apprenticeship experience and registration, the system of examination by which men called up in groups of about 25 and examined by the Members of the Board without the assistance of outside examiners or proctors, and saying that in the Oral Examination most failures occur through the ignorance of the candidates on the Pharmacy Law of the State, especially in regard to the sales of poisons, etc. He cited figures showing the percentage of passes in the New Jersey Board Examinations from the different colleges.

He mentioned the fact that there are 35 Class A Hospitals approved by the *A. M. A.* in the state, only 20 of which employ one or more pharmacists; from one employing no pharmacist one of the Board Members had once received a call for information about "AG number 3" (meaning $AgNO_3$). In conclusion Dr. Fischelis urged pharmacists to stand behind their State Boards, saying that every Board is harassed by groups which are trying to break down regulations; he asked them to consider the question "Let the State Legislature abolish the Board of Pharmacy and what have you left?"

The president then opened the meeting for discussion in which President Gesoalde, of the New York State Pharmaceutical Association, Drs. Schaefer Wimmer and Mayer and Messrs. Kopald, Liberman, Seely and Groisser took part.

A rising vote of thanks was accorded to the speakers and the meeting adjourned at 11:30, concluding one of the most interesting meetings of the Branch.

HERBERT C. KASSNER, *Secretary.*

PHILADELPHIA.

The November meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Philadelphia College of Pharmacy and Science, Tuesday evening, November 11, 1930. The meeting was called to order by President Dunn, who presented the speaker of the evening, Dean Julius W. Sturmer.

Dr. Sturmer selected as his subject, "Ultra Violet Light" and gave such an interesting demonstration of its application with the Hanovia Ultra Violet Lamp that the audience sat spellbound and reluctantly saw the demonstration come to a close. During the discussion which followed, many interesting questions

involving the uses of ultra violet light were asked and satisfactorily answered by the speaker.

The regular business meeting followed. After the reading of the minutes of the October meeting, and their approval, President Dunn informed the group of Secretary Rieve's desire to be relieved of his duties as secretary.

A motion that his resignaton be accepted was duly made and passed.

William J. Stoneback was appointed to serve as secretary *pro tem* until the next regular election of officers.

WILLIAM J. STONEBACK, *Secretary pro tem.*

UNIVERSITY OF WASHINGTON.

The regular monthly meeting of the Branch was held October 30th in Bagley Hall. Seventy-five were in attendance. After a few brief remarks by Chairman Guth relative to the function of the Branch, Dean C. W. Johnson was introduced as the speaker of the evening. Last year Dean Johnson and family completed a tour around the world, and the talk for the evening was on experiences and observations made during the trip. At Manila Dean Johnson represented the American Association of Colleges of Pharmacy and duly inspected the college of Pharmacy University of Manila. The talk was supplemented by photographs taken *en route*. Wherever feasible the drug store or the condition of pharmacy of the particular country was emphasized. Not only did this talk present some phases of foreign pharmacy, but as a travelogue added to the listeners' education.

H. A. LANGENHAN, *Secretary.*

A PRACTICE THAT WILL IMPRESS THE IMPORTANCE OF PROFESSIONAL PHARMACY.

In order to establish a closer relationship between newly registered pharmacists and the State Board of Pharmacy, as well as to impress upon the new registrants the importance of the privileges conferred upon them, the Board of Pharmacy of the State of New Jersey inaugurated a new system of awarding Certificates of Registration at a meeting held December 2, 1930.

The eighty-seven registrants who qualified at the October examinations of the Board were assembled in the State House at Trenton, and after listening to words of welcome by President C. Graham McCloskey of the Board of Pharmacy and addresses by Henry C. Christensen, President of the AMERICAN PHARMACEUTICAL ASSOCIATION, and Secretary of the National Association of Boards of Pharmacy, and Robert P. Fischelis, Secretary of the New Jersey Board of Pharmacy, the Certificates of Registration were awarded by Hon. Arthur W. Pierson, Acting Governor of the State.

There were present in addition to the members of the Board of Pharmacy of the State of New Jersey and the registrants, Secretary Charles F. Kramer of the Pennsylvania Board and Messrs. John M. Woodside and Percy Davis of the Pennsylvania Board; Secretary John O. Bosley of the Delaware Board; Chairman Fred W. Warnke of the Board of Trustees of the New Jersey Pharmaceutical Association, Secretary P. R. Loveland and the following Trustees of the New Jersey Pharmaceutical Association: D. G. Singer, Ray Williams and E. Beitman. Daniel H. Hills, former President of the Board of Pharmacy, and Henry D. Kohr, Chairman of the Committee on Public Health and Welfare of the New Jersey Pharmaceutical Association, were also present.

Mr. McCloskey, in his opening remarks, stated that the examination of applicants affords no opportunity for personal contact other than the formal relationship of examiner and applicant, and that the Board had asked the new registrants to come to Trenton to receive their certificates at the hands of the Governor in order to emphasize the fact that a license to practice Pharmacy is not a mere certificate to be displayed in a drug store, but is a badge of confidence bestowed upon the recipient by the people of the state through their chosen representatives.

After congratulating the new registrants upon the satisfactory completion of the requirements for registration, Mr. McCloskey expressed the hope that the Board would have the cooperation of the new registrants in upholding the laws governing the practice of Pharmacy and in furnishing a proper background for the training of apprentices who will be the pharmacists of the future.

In introducing Mr. Christensen, President McCloskey called attention to the fact that the former had come all the way from Chicago to help inaugurate the new departure in awarding Certificates of Registration, and referred to Mr. Christensen's untiring efforts in behalf of fostering better relations between Boards of Pharmacy and in making the interchange of Certificates of Registration between the various states a practical procedure.

Mr. Christensen congratulated the New Jersey Board upon the inauguration of what he termed a "unique" occasion. He stated that it would be a splendid thing if every state inaugurated a similar procedure in the award of certificates of registration, but that larger states might find difficulty in assembling registrants conveniently in order to accomplish this object.

He reviewed the progress that had been made in advancing the standards of pharmaceutical practice, and predicted a bright future for those who are entering the profession at the present time.

Mr. Christensen urged the new registrants to keep in mind that the pharmaceutical phases of the drug business constitute the back-bone of the practice of pharmacy, and he urged them to get at least two or three years of experience in different types of drug stores before going into business for themselves.

Mr. Christensen concluded his address with a reference to the AMERICAN PHARMACEUTICAL ASSOCIATION and other organizations, urging his listeners to affiliate with their local, state and national association at an early date so as to maintain contact with the profession from the very start of their career as registered pharmacists.

Dr. Fischelis[1] reviewed the provisions of the State Pharmacy Law, exphasizing in particular those sections of the Pharmacy Act which are frequently violated because of careless methods and lack of attention to detail on the part of pharmacists. He read the Code of Ethics of the AMERICAN PHARMACEUTICAL ASSOCIATION, describing the ethical relationship of the pharmacist to the public, to the medical profession and to his colleagues. At the conclusion of the reading of this code, the newly registered pharmacists signed it. In concluding his address, Dr. Fischelis said:

"We like to dream about the professional aspects of our calling, but sometimes when we are faced with the cold realities of making a living out of the profession, the ideals of which we dream appear very far away. Contrast the picture of 'The Druggist' which has recently been displayed in many pharmacies—I mean the picture of the apothecary called out in the middle of the night to fill a prescription intended to restore to health some ailing child, with the anxious family at the bedside awaiting the return of the youth who sits at the side of the pharmacist as the prescription is compounded by the light of an oil lamp—contrast this, I say, with the hurly burly everyday merchandising activity of the average drug store. If you are inclined to be cynical you may ask 'How often do we get a chance to practice this profession?' But have you ever watched a physician or a lawyer or a preacher at work? The comparatively short time spent by the physician in the operating room, the clergyman in his pulpit and the lawyer at the bar correspond to the momentary thrill which you will get when you compound a difficult prescription to aid some sick child. The digging for precedents and points of law in musty tomes and legal volumes on the part of the lawyer; the monotonous attendance upon socials and ladies-aid meetings which is a part of the routine activity of every preacher, and listening to the description of the aches and pains of the average run of patients, which of necessity constitutes a large part of the physician's daily task, are all comparable to what we call the daily grind of the drug store. No profession has a monopoly of thrills and self-sacrificing service; so let us not become discouraged if the hard work and sacrifice which are represented in the achievement of your certificate of registration do not lead at once to a part in the play of life which corresponds to that of the leading man or the hero. The important thing is to be ready to act the part when the opportunity comes."

As Governor Larson was in Florida, the certificates of registration were awarded by Acting Governor Arthur H. Pierson who is also the president of the State Senate. Governor Pierson, in addressing the registrants, climaxed the exercises beautifully with his sincere good wishes and commended to the registrants that they use their newly conferred privileges in a manner to reflect credit upon themselves and upon the State of New Jersey. He cited experience from his own business career to emphasize the importance of adhering closely to the Code of Ethics of the pro-

[1] The address of Dr. Fischelis on "Our Legal and Moral Obligations" is only given in part; it merits printing in full and reading by all pharmacists.

fession and of treating competitors fairly. At the conclusion of his remarks, the Governor was given an ovation by those assembled.

Following the exercises at the State House, the registrants, members of the Board of Pharmacy and visitors, were guests of the New Jersey Pharmaceutical Association at a luncheon which had been arranged at Hildebrecht's Hotel. Chairman Fred W. Warnke of the Board of Trustees of the New Jersey Pharmaceutical Association presided at the luncheon, and short addresses were made by Secretary Loveland of the New Jersey Pharmaceutical Association and by Secretary Fischelis of the Board of Pharmacy. A representative of the newly registered pharmacists thanked the New Jersey Pharmaceutical Association and the Board of Pharmacy for the courtesies that had been extended to them, and assured the Board that they would endeavor to uphold the high standards which had been set for them.

Fresco from the dispensary of the Hospital de Santo, bearing the inscription (translated) "The purple-clad father comforts the sick in this building with the fever bark of Lima"—with him are the doctor and apothecary.

CONGRESS OF MILITARY MEDICINE AND PHARMACY.

The Sixth International Congress of Military Medicine and Pharmacy has been arranged to take place at the Hague from June 1 to 6, 1931. The subjects to be discussed are: (1) Recruiting, establishment and training of military surgeons and pharmacists (contributors: Holland and Jugoslavia). (2) The psychoneuroses of war; immediate and remote effects of war on the nervous system of soldiers and civilians (contributors: France and United States of America). (3) The treatment of hemorrhage on the battlefield; the most urgent remedies essential, and some conditions of their application (contributors: Holland and Italy). (4) The preparation and preservation of medicines in tablet form used in the medical services of the Navy and Army (contributors: Holland and Rumania). (5) The after-effects of war injuries of the teeth and the lower jaw and their treatment (contributors: Holland and Poland). A full program of social events has been arranged and, in addition, there will be a historical exhibition of the sanitary and health services and the sea, land and air forces. The committee in charge of the exhibition is composed of le Medecin Principal de première classe Denekamp, Dr. de Lint, Associate Professor of the History of Medicine in the University of Leyden, le Medecin Major deuzieme classe doornickx, and Dr. Molema (Netherlands Red Cross). All inquiries should be addressed as follows: Direction du Service de Sante Ministere de la Guerre, La Haye, Holland.

ASSOCIATION BUSINESS

THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1930–1931.

Office of the Secretary, 10 West Chase St., Baltimore, Md.

LETTER NO. 5.

November 14, 1930.

To the Members of the Council:

52. Associate Members. Motion No. 14 (see Council Letter No. 4, page 1150) has been carried.

53. Student Branches. Motions Nos. 15 and 16 (see Council Letter No. 4, page 1151) have been carried. For the information of the members of the Council there is attached a copy of a letter to the Deans of Schools and Colleges of Pharmacy and copies of the enclosures sent with this letter.

54. Use of the Text of the N. F. V. The following communications have been received from Chairman DuMez of the Committee on Publications:

"I have looked over the manuscript for the new edition of Potter's 'Therapeutics,' and find that it is very similar to the edition already published. Inasmuch as they were given permission to use portions of the text of the N. F. in the former edition I can see no reason why they should not again be given this privilege. I, therefore, recommend to the Council that permission be given to use portions of the text of the N. F. in Potter's 'Therapeutics,' 15th edition, and that the usual fee of $5.00 be charged for this privilege."

"The extent to which the text of the National Formulary will be used in the book on 'Bioassays' by Dr. James C. Munch is so small that I am satisfied that no member of the Publication Committee will object to this privilege being granted. I am, therefore, recommending to the Council that permission be granted Dr. James C. Munch to use portions of the text of the National Formulary V for comment in his book on Bioassays and that the usual fee of $5.00 be charged for this privilege."

(*Motion No. 17*) *It is moved by DuMez that P. Blakiston's Son & Co., Inc., and The Williams & Wilkins Company be given permission to use the text of the N. F. V for partial reproduction in Potter's "Therapeutics," Fifteenth Revision, by Dr. R. J. E. Scott, and in "Bioassays," by Dr. J. C. Munch, respectively, and at the usual charge of $5.00 in each case.*

55. Committee on Unofficial Standards. The following communication has been received from Chairman J. C. Krantz, Jr., of this committee:

"Dr. H. H. Rusby has resigned as a member of the Committee on Unofficial Standards, due to the pressure of other work. As chairman of this Committee, I hereby recommend that Dr. Rusby's resignation be accepted and that Dr. Adolph Ziefle, Corvallis, Oregon, be elected as a member of the Committee to fill the vacancy made by the resignation of Dr. Rusby."

(*Motion No. 18*) *It is moved by Kelly that the resignation of Dr. H. H. Rusby as a member of the Committee on Unofficial Standards be accepted with regret and with the thanks of the Council for the service he has rendered in this capacity, and that Dr. Adolph Ziefle be elected a member of this Committee to fill the unexpired term of Dr. Rusby, ending in 1934.*

56. Federal Wholesale Druggists' Association. The following communication has been received from Secretary R. E. L. Williamson:

"At the convention of the Federal Wholesale Druggists' Association, held in Rochester, September 12, 1930, the enclosed resolution was unanimously passed and I was instructed to send you a copy of same as secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION."

"*Resolved*, that the Federal Wholesale Druggists' Association go on record as endorsing the valuable work accomplished for the pharmacist and pharmacy by the AMERICAN PHARMACEUTICAL ASSOCIATION, and that a copy of this resolution be sent to the secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION."

The following letter was written to Secretary Williamson:

"This will acknowledge the receipt of your letter of October 16th enclosing copy of

resolution adopted by the Federal Wholesale Druggists' Association at their convention held in Rochester, September 12, 1930, and I will have the pleasure of bringing this resolution to the attention of our Council within a short time.

"It is very encouraging and stimulating to have the work of our ASSOCIATION endorsed by such representative groups as the Federal Wholesale Druggists' Association, and we appreciate the closer coöperation which is developing between the two organizations right along."

57. Committee on Pharmaceutical Research. As authorized by the Council, 1929–1930, at its fourth meeting in Baltimore, May 9th (see JOURNAL A. PH. A. for May, page 546), a grant of $500 was made to Dr. H. A. Langenhan and Mr. Earl Guth of the School of Pharmacy, University of Washington, for research work on Drug Extraction.

The following letter has been received from President M. Lyle Spencer of the University of Washington:

"I have been asked by the Board of Regents of the University to express to you their appreciation of the fellowship, in the amount of $500, which the AMERICAN PHARMACEUTICAL ASSOCIATION has offered our College of Pharmacy.

"The Board accepts the fellowship with pleasure and is grateful for your interest in the University."

The following reply was written to President Spencer:

"Your letter of October 14th will be brought to the attention of our Council, and I am confident that the members of the Council will greatly appreciate this expression on the part of the Board of Regents of the University of Washington."

58. New York Branch, A. Ph. A., Resolution by Mr. H. W. Ambruster. The following communication was received from Secretary H. C. Kassner of the Branch:

"At the meeting of the New York Branch of the A. PH. A., held on October 13th, Mr. H. W. Ambruster, a member of the Branch, introduced the following resolution:

" 'WHEREAS, serious charges have recently been made before the U. S. Senate Committee on Agriculture regarding nonenforcement of Standards of the U. S. Pharmacopœia by Federal officials, and

" 'WHEREAS, the integrity of the Pharmacopœia is the most precious possession of all Pharmacists who fulfill their obligations to the public, and to the medical profession, and

" 'WHEREAS, efforts to smother public discussions of this subject have come to our attention, therefore be it

" '*Resolved*, That as free men and citizens we resent any attempt to prevent fullest discussion of any matter relating to Pharmacy, and we urge that these Senate hearings be continued until all such charges are investigated for the sole benefit of the public health, which is dependent upon us.'

"Upon motion of Dr. H. V. Arny, duly seconded and carried, this resolution was referred to the A. PH. A. Council, without discussion on the part of the Branch. Mr. Ambruster was informed that we could take no action. The proviso under which we operated was Article 3 of Chapter 7 of the By-Laws of the A. PH. A. found on page xxvi of the A. PH. A. YEAR BOOK of 1926."

The members of the Council are, no doubt, advised that the hearings of the Committee on Agriculture have been concluded but that the Committee has not made its report to the Senate.

59. Publication of Supplements to the N. F. (See Council Letters No. 2, page 922; No. 3, page 1024; and No. 4, page 1150.) The following letter has been received from Dr. W. B. Day:

"I am in sympathy with the recommendation of the Committee to publish supplements to the N. F., and yet, as you are no doubt aware, a proposition to supply supplements to the Pharmacopœia was voted down at the Convention. I can see a number of advantages in having such supplements, particularly, if certain changes in the policy of the ASSOCIATION with respect to the scope of the N. F. are to be made. However, it is quite evident that the need for decision upon the publication of supplements is not urgent, since the Formulary can hardly be ready for publication for several years yet, and for this reason it seems to me better that we take our time in the consideration of this important matter, and discuss it when the Council meets next at the annual convention. There will, no doubt, be an opportunity to have the Chairman and members of the N. F. Revision Committee meet with the Council at that time, so that

we may get their views on this matter before reaching a decision."

And the following letter from Chairman Gathercoal:

"The Resolution proposing supplements to the National Formulary was endorsed unanimously at the Cleveland meeting, yet I believe it has not received the full discussion it should have, nor has the full import of N. F. supplements been realized. Therefore, if there seems to be a marked division in the Council over this question, would it not be possible to lay the matter on the table until the Miami meeting and take action inviting discussion of it? There is really no haste in deciding this matter as I think there is no intention of issuing supplements until after N. F. VI has become official."

If there are no further comments to be submitted at this time and if there is no objection, the matter of supplements will be laid on the table and made a special order of business at the second meeting of the Council in Miami in July 1931.

60. Life Membership. Mr. Parker Cook, Baltimore, Md., has become a Life Member of the A. PH. A. through the payment of $40.00.

61. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received:

No. 66, Jack Boyer, 2711 Jetton Ave., Tampa, Fla.; No. 67, Harold Wesley Brown, 2417½ Fifth Ave., Seattle, Wash.; No. 68, Paul J. Burgess, 1721 Hills Ave., Tampa, Fla.; No. 69, Harry W. Childs, 327 Central Ave., St. Petersburg, Fla.; No. 70, Cecil C. Clark, 44 Gerrard St., E., Toronto, 2, Ontario, Can.; No. 71, Edward D. Cleveland, Baytown, Texas; No. 72, Peter Czaja, 3739 Junction, Detroit, Mich.; No. 73, Austin A. Dodge, 209 N. Main St., Eagerton, Wis.; No. 74, Eli A. Dorfman, 4300 Buchanan St., Detroit, Mich.; No. 75, Maurice Dunay, 1311 Grant Ave., Bronx, N. Y.; No. 76, John R. Filarski, 2458 E. Davison Ave., Detroit, Mich.; No. 77, Wm. A. Frailey, 1629 Col. Rd. No. 707, Washington, D. C.; No. 78, Robert S. Fuqua, 1233 N. Linwood Ave., Baltimore, Md.; No. 79, J. J. Gerig, Ocala, Fla.; No. 80, David J. Gleason, U. S. Marine Hospital, Chelsea, Mass.; No. 81, Herbert Green, 70 Pall Mall, London, S. W. 1, England; No. 82, Roy Gullekson, 3360 Buchanan St., Detroit, Mich.; No. 83, Philip Haller, 120 West 20th Street New York, N. Y.; No. 84, Joseph H. Haughton, 318 Lemon St., Palatka, Fla.; No. 85, A. Finstad, 101 N. E. 2nd St., Miami, Fla.; No. 86, Julian Hersh, 157 Golden Hill, Bridgeport, Conn.; No. 87, Wm. L. Johnson, 400 S. W. 8th Ave., Miami, Fla.; No. 88, William Wiley Johnson, 336 Tyler St., Oxford, Miss.; No. 89, C. B. King, Menard, Texas; No. 90, E. J. McCabe, 3467 Michigan Ave., Detroit, Mich.; No. 91, D. F. McLemore, Britton, Okla.; No. 92, Thomas R. Moore, 2012 Hearst Ave., Berkeley, Calif.; No. 93, Attilio O. Nucelli, 1809 Wallace St., Philadelphia, Pa.; No. 94, E. W. Parrish, 20731 John R. St., Hazel Park, Mich.; No. 95, Ray Arthur Pateleski, Hill Ave., Aurora, Ill.; No. 96, P. E. Penberthy, 33 W. Church St., Orlando, Fla.; No. 97, L. Perreault, 325 1st Avenue, Quebec, Canada; No. 98, Bird S. Potter, Gothenburg, Nebr.; No. 99, Lester A. Reeves, Munsey Bldg., Washington, D. C.; No. 100, H. R. Rudy, 96 W. Washington St., Hagerstown, Md.; No. 101, W. L. Scheibler, 728 S. W. 27th Ave., Miami, Fla.; No. 102, Israel Sherman, 2547 Aqueduct Ave., Bronx, N. Y.; No. 103, I. C. Smith, 61 E. 21st St., Miami, Fla.; No. 104, Eli Stevens, 1160—59th St., Brooklyn, N. Y.; No. 105, Lawrence J. Taylor, P. O. Box 816, Eustis, Fla.; No. 106, John Tencza, 4755 Michigan Ave., Detroit, Mich.; No. 107, Frederick Voigt, 604 East Fourth St., Chattanooga, Tenn.; No. 108, Edward Cecil Watts, University Hospital, Ann Arbor, Mich.; No. 109, F. H. Woods, 487 Third St., Pitcairn, Pa.

(*Motion No. 19*) *Vote on applications for active membership in the A. Ph. A.*

62. Applicant for Membership on Account of Contribution to the Headquarters Building Fund. The following non-member of the A. PH. A. has pledged $25.00 or more to the Headquarters Building Fund and has made a cash payment of $5.00 or more. He is entitled to membership and you are requested to vote on the application which has been properly endorsed.

H-16, Nathan L. Mozer, 5138 W. 29th Ave., Denver, Colo.

(*Motion No. 20*) *Vote on application of contributor to the Headquarters Building Fund for membership in the A. Ph. A.* E. F. KELLY, *Secy.*

A Very Merry Christmas and an Increasingly Happy and Prosperous New Year.

EVENTS OF 1930 THAT HAVE A DIRECT OR INDIRECT INTEREST FOR PHARMACISTS.

The following list is by no means complete, but these few references may serve pharmacists in creating an interest among the editors of the daily or weekly papers and result in desirable publicity for pharmacy. It should also be understood that, in all probability, events of greater interest have been, unintentionally, omitted; we would be pleased to have additional items. No effort has been made to assemble the items, as selection will be made according to the views of the editors.

The reason for the existence of pharmacy is the practical service to man. All of this service is not rendered directly. It is a service of supplying medicine in most effective form, using due care in the preparation, thereby protecting the physician as well as the patient; hence both are concerned in the pharmacy and in the qualifications of the pharmacist, to uphold the standards and restrict the preparation and sale of medicines to those properly trained and who, therefore, realize their responsibility.

A fundamental and important contribution of pharmacy is the pronounced effort of most of the leading pharmaceutical associations to foster, stimulate and encourage fundamental research in the production of drugs and medicines for the alleviation of human pain and suffering.

The 78th annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION; the 27th of the National Association of Boards of Pharmacy; the 21st of the American Association of Colleges of Pharmacy—were held in Baltimore, Md., during the week of May 5th—presided over by H. A. B. Dunning (A. PH. A.), John A. J. Funk (N. A. B. P.), J. G. Beard (A. A. C. P.), respectively. The attendance was the largest in A. PH. A. history. More than 70 papers were presented before the Scientific Section of the ASSOCIATION at that meeting. A most interesting part of the program of the ASSOCIATION was the session devoted to a discussion of the Headquarters Building, which is to be known as the American Institute of Pharmacy. A that time reports were made by President H. A. B. Dunning and Secretary E. F. Kelly and addresses by Dr. H. S. Wellcome of London, England, and Dr. A. R. L. Dohme, and others. More than $800,000 have been subscribed. A site for the building near the Lincoln Memorial, in Washington has been purchased.

Fifteen national associations related to pharmacy were represented by nearly 100 delegates in the National Conference of Pharmaceutical Research, held in Washington, D. C., December 12th. Prof. E. N. Gathercoal, of the University of Illinois School of Pharmacy, is the *President*, and Dr. John C. Krantz, Jr., Baltimore, is the *Secretary*.

Thirty-eight state associations and eight national associations were represented in the House of Delegates of the AMERICAN PHARMACEUTICAL ASSOCIATION, presided over by Chairman R. L. Swain. The Resolutions adopted are printed in the May JOURNAL. Reports were made on Pharmacy Corps of various countries and on the work of the Committee on Pharmacy Corps in the U. S. Army.

The Eleventh Decennial meeting of the United States Pharmacopœial Convention composed of physicians and pharmacists, representing Colleges of Medicine and Pharmacy, Medical and Pharmaceutical Associations and scientists representing other related organizations, gathered in Washington on May 13th and 14th to frame the policies which will guide the work of revising the Pharmacopœia to bring it up-to-date within the next few years.

The officers for the 1930–1940 decennium are:

President, Dr. W. A. Bastedo, New York; *Vice-Presidents*, H. A. B. Dunning, Baltimore; Dr. J. F. Anderson, New Brunswick, N. J.; Edward Spease, Cleveland, Ohio; Dr. R. A. Lyman, Lincoln, Nebr.; Thomas Roach, Oklahoma City; *Secretary*, L. E. Warren, of the Department of Agriculture, Washington; *Assistant Secretary*, F. A. Delgado, of the Department of Commerce, Washington; *Treasurer*, Samuel L. Hilton, Washington, reëlected.

The officers of the Committee of Revision, U. S. P. XI, are the following: E. Fullerton Cook, Philadelphia, *Chairman;* A. G. DuMez, Baltimore, *First Vice-Chairman;* Dr. W. A. Edmunds, Ann Arbor, Mich., *Second Vice-Chairman;* Charles H. LaWall, Philadelphia, *Secretary. The committee of revision is composed of 51 members.*

The Committee of Revision, National Formulary VI, has been organized for work. The

National Formulary has the same standing as the U. S. Pharmacopœia in national and state laws. The members of the Committee are: *Chairman*, I. N. Gathercoal, Chicago, Ill.; *Vice-Chairman*, Louis Saalbach, Pittsburgh, Pa.; *Secretary*, Adley B. Nichols, Philadelphia, Pa.; Gustav Bachman, Minneapolis, Minn.; H. A. Langenhan, Seattle, Wash.; Paul S. Pittenger, Philadelphia, Pa.; Wilbur L. Scoville, Detroit, Mich.; O. A. Farwell, Detroit, Mich.; H. V. Arny, New York, N. Y.; Bernard Fantus, Chicago, Ill.; Leonard Seltzer, Detroit, Mich.; E. L. Newcomb, New York, N. Y.; S. L. Hilton, Washington, D. C.; I. A. Becker, Chicago, Ill.; Glenn L. Jenkins, Baltimore, Md. Associate Member, the *Chairman* of the Revision Committee, U. S. Pharmacopœia.

A color exhibit at the Pharmacopœial Convention, May 1930, showed that 267 color names are used about 2400 times in U. S. P. The exhibit gave an historical account and methods for analyzing and naming colors.

Dr. Lyman Spalding, Father of the U. S. Pharmacopœia, was one of the nominees for the Hall of Fame; though unsuccessful in the election his name will again be presented for the honor in 1935.

This is the 50th anniversary of Richard H. Stabler, as president of the AMERICAN PHARMACEUTICAL ASSOCIATION. Richard H. Stabler was of the family of Edward Stabler, founder of the pharmacy now known as the Leadbeater Pharmacy. Here General Washington procured his medicines and two Washingtons—Augustine and Lawrence—learned the drug business and, later, established themselves in West Virginia.

The Committee on Pharmaceutical Syllabus, of which Prof. J. G. Beard, University of North Carolina, is *Chairman*, has taken up the revision of the Syllabus. A report was made at the Baltimore meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION. The Pharmaceutical Syllabus is prepared to indicate the general scope and character of the instruction given in pharmacy schools and the work to be done by the students, but does not interfere with the freedom in the methods of instruction in pharmacy schools.

A Committee has been appointed by the American Association of Colleges to consider the national education policy relative to the new four-year curriculum proposed for the schools of pharmacy beginning with 1932. The Committee is composed of Deans Townes R. Leigh, University of Florida; Julius A. Koch, Pittsburgh College of Pharmacy; Edward H. Kraus, University of Michigan; Rufus A. Lyman, University of Nebraska; Henry C. Biddle, University of California.

The year has seen a wonderful support of better and higher pharmaceutical education exemplified especially in: (*a*) the voluntary rise to the four-year course of so many colleges before 1932, the year agreed upon as the one upon which the American Association Colleges of Pharmacy requirements are to go into effect; (*b*) the marked interest in the development of graduate work in pharmacy, several of the colleges having developed their graduate departments to a point where graduates may go on to the Ph.D. degree in the science fields of pharmacy; (*c*) in the growing number of legislative acts making graduation a prerequisite to state board examinations. A number of buildings for pharmacy schools have been completed during 1930.

An innovation in the matter of impressing upon newly registered pharmacists the importance of the trust that is imposed in them when they become licensed to practice their profession was introduced by the New Jersey Board of Pharmacy on December 2nd, when eighty-seven newly registered pharmacists were publicly presented with their Certificates to practice, at the State House in Trenton. The presentation was made by the Acting Governor of the State in the presence of the President of the AMERICAN PHARMACEUTICAL ASSOCIATION, members of the New Jersey Board of Pharmacy, and members of Boards of Pharmacy from neighboring states. These registered pharmacists signed the Code of Ethics of the New Jersey Board. (The code adopted is that of the AMERICAN PHARMACEUTICAL ASSOCIATION.)

Forty-eight states and territories are represented by affiliation of the respective boards of pharmacy in the National Association of Boards of Pharmacy. Eighty-one delegates were present at the annual meeting held in May at Baltimore. The officers are: *President*, W. M. Hankins, Florida; *Treasurer*, J. W. Gayle, Kentucky; *Secretary*, H. C. Christensen, Illinois. The ASSOCIATION coöperates with the American Association of Colleges of Pharmacy for the advancement of pharmaceutical education, studies and aids in the bettering and enforcement of laws.

Julius W. Sturmer was elected *President* of the American Association of Colleges of Pharmacy; C. B. Jordan was elected Chairman of the House of Delegates, A. PH. A. His address,

during the meeting, on "The Progress of Professional Pharmacy" had a most encouraging outlook for its advancement.

Miami, Florida, was selected for the 1931 meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, and G. H. Grommet has been named the Local Secretary. President H. C. Christensen will preside over the meetings.

The issuance of the "Pharmaceutical Recipe Book" by the AMERICAN PHARMACEUTICAL ASSOCIATION is an outstanding event of the year which places in the hands of the American pharmacist a book of reference and of non-official formulas. A purpose is to establish a greater uniformity in the dispensing of the latter.

The Conferences of Pharmaceutical Association Secretaries and Pharmaceutical Law Enforcement Officials were held during the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION. These Conferences will be helpful to the membership through the discussion of problems which come up in the respective states represented. The "Round Table" discussions of the former aid in developing the efficiency of the secretarial offices, and the reports of the latter make for better enforcement of laws.

Secretary R. J. B. Stanbury and President M. R. MacFarland of the Canadian Pharmaceutical Association attended and addressed the AMERICAN PHARMACEUTICAL ASSOCIATION at its meeting in Baltimore during the week of May 5th. The AMERICAN PHARMACEUTICAL ASSOCIATION met in Toronto in 1877, in 1896 in Montreal, and in 1932 its 80th annual meeting will be held in Toronto.

As a part of the ceremonies of the Canadian Pharmaceutical Association held at Halifax, August 4th–7th, a tablet to the memory of Lewis Hebert, the first American apothecary, was unveiled. He came to Canada in 1604.

Dr. Albert Goris, of Paris, France; Dr. Rudolpho Albino Diaz de Silva, Rio de Janeiro, Brazil, and Dr. Armando Soto Parada, of Valparaiso, Chile, were elected honorary members of the AMERICAN PHARMACEUTICAL ASSOCIATION at the 1931 meeting in Baltimore.

The Ebert Prize for 1930 was awarded by the AMERICAN PHARMACEUTICAL ASSOCIATION to Marvin R. Thompson, for some time assistant pharmacologist of the Food and Drug Administration, U. S. Department of Agriculture; he is now Emerson Professor at the University of Maryland. The award was made for his contributions on the pharmacology of ergot.

Dr. Edward Kremers of the University of Wisconsin was awarded the Remington Honor Medal for 1930 for his distinguished service to pharmaceutical education and research and his promotion of interest in the history of pharmacy. The award was established in memory of Prof. Joseph P. Remington by New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION. Other recipients, in former years, are: James H. Beal, John Uri Lloyd, H. V. Arny, H. H. Rusby, George M. Beringer, Henry M. Whelpley, H. A. B. Dunning, Charles H. LaWall, Wilbur L. Scoville.

Pharmacy Week of 1930 was a great success. President Hoover and Secretary Hyde, of the Department of Agriculture, and Secretary Julius Klein of the Department of Commerce sent congratulatory messages. National Chairman, Robert J. Ruth, states that the profession of pharmacy is solidly behind the National Pharmacy Week movement which is primarily in the interest of public health. Each year the observation of Pharmacy Week is increasingly successful and indicates that professional pharmacy is assuming a greater importance in the minds of the pharmacist and the public.

March 16th to 22nd was First Aid Week. This presents an opportunity for making the public acquainted with the service of pharmacy.

An unfortunate error in dispensing at an army hospital dispensary resulted in the death of two children. The occurrence pointed to the need of qualified pharmacists for dispensing, whether in civil or government activities, and an editorial in the August JOURNAL A. PH. A. calls attention to the importance.

More recently packaging of oxalic acid for epsom salts by a Mail Order house emphasized the danger in the sale of drugs by others than pharmacists.

Justus C. Ward of the U. S. Department of Agriculture has been studying the effect of thallium poisoning in sheep, as a result of using thallium as a lethal agent for the control of noxious rodents. Thallium poisoning causes alopecia in such lethal doses whereby sheep ranchers sustain great losses.

The Porter Bill has become law; it creates a new division—the Bureau of Narcotics in the Treasury Department.

The Indiana law taxing chain stores was declared unconstitutional by the District Court of Southern Indiana.

The North Dakota Supreme Court rendered a decision confirming that the Governor must appoint members for the State Board of Pharmacy from a list submitted by the State Pharmaceutical Association.

The Attorney General of Illinois has ruled that no person in Illinois, unless he or she is a registered pharmacist, may be a member of a partnership engaged in any manner in the operation of a drug store.

Senator Morris Sheppard has introduced a bill in the U. S. Senate which seeks to amend the Harrison Act by the inclusion of Cannabis.

The Supreme Court of the State of Iowa sustained the action of the District Court, restraining grocery stores from selling aspirin.

A report was adopted by the Central Opium Board, October 18th, which reflects a stronger will to keep a vigilant eye on the narcotic traffic.

The North Carolina license tax on branch and chain store operators has been held constitutional by the State Supreme Court.

The Alcohol Advisory Council has been organized with Henry S. Chatfield as *Chairman; Vice-Chairman*, A. Homer Smith; *Secretary*, Dr. Harrison E. Howe.

Harry J. Anslinger, who has been acting Narcotics Commissioner, was named Commissioner by President Hoover on September 23rd.

The Ohio Supreme Court upheld the Ohio Board of Pharmacy in denying a certificate to an applicant who had been convicted of a felony.

The minutes of the Conference of Pharmaceutical Law Enforcement Officials are reported in the October number of the JOURNAL A. PH. A. and a number of interesting addresses on Law Enforcement are printed therein.

Dr. Oliver Kamm, of Detroit, has been elected *President* of the Michigan Academy of Science, Arts and Letters for 1930–1931.

Prof. Elie H. La Pierre, of Cambridge, Mass., is the honorary president of the AMERICAN PHARMACEUTICAL ASSOCIATION for 1930–1931.

Dr. Lyman F. Kebler reported on the work of three pioneers in initiating Federal Food and Drug legislation, in a paper before the AMERICAN PHARMACEUTICAL ASSOCIATION.

Dr. F. B. Kilmer contributed an article on the birth of the scientific journal and presented an early volume, *Journal des Scavans*, to the AMERICAN PHARMACEUTICAL ASSOCIATION.

Dr. Hugh S. Cumming, surgeon general of the U. S. Public Health Service, was installed as president of the American Public Health Association at its Fort Worth meeting, October 31st.

Surgeon General Meritte W. Ireland has been reappointed. This is his fourth appointment as surgeon general; he will reach the retiring age May 31, 1931.

Dr. John C. Krantz, Jr., pharmacist, has been appointed chief of the Bureau of Chemistry by the Maryland State Board of Health, succeeding the late Dr. Wyatt W. Randall.

Dr. Charles Whitebread, Assistant Curator, Division of Medicine, U. S. National Museum, writes of the U. S. National Museum Pharmacy collection, its aims, problems and accomplishments in the October JOURNAL A. PH. A.

The leading thought in recent court decisions relative to pharmacy and the sale of drugs has been based on safer and better service for the public. The decisions have favored restriction in cases wherein knowledge gave the public greater safety and better service.

The importance of pharmaceutical service in hospitals and dispensaries as well as the necessity of placing this service on the same basis as to regulations, as in civil life, has received gratifying consideration.

Attention has been drawn to the desirability of appointing a pharmacist on each state and local Board of Health.

The introduction of bills in the Senate and House of Representatives to provide for the creation of a Pharmaceutical Corps in the United States Army, and the hearing before the House Committee on Military Affairs on these measures, marked an important step in the steady advance toward the recognition of Pharmacy in the various branches of the Government service.

The Parker Bill was passed by both houses of Congress and has been signed by the President. Its purpose is to coördinate the activities of the Public Health Service. The law places the dental, sanitary engineering and pharmacy officers of that service on the same basis as to appointment, promotion, etc., as medical officers.

The preliminary report of the Personnel Classification Board places pharmacy in the Professional and Scientific Service. Heretofore pharmacy has been classified in the Sub-professional Service only.

Legislation is now before Congress to commission physicians, dentists and pharmacists in the U. S. Veterans Bureau, who are now civilian employees and to create a Medical, a Dental and a Pharmacy Corps.

As a result of the enactment of the Parker Bill the following Assistant Pharmacists in the Public Health Service were named, and confirmed by the Senate on December 10th: Edgar B. Scott, Edwin M. Holt, William L. Stearns, Frank L. Gibson, Newton C. Comfort, Carl Stier, Clarence H. Bierman, Walter H. Keen, Raymond D. Kinsey, Thomas C. Armstrong. The rank of these pharmacists corresponds to that of *First Lieutenant.*

The personnel of the U. S. Public Health Service—consisting of a corps of medical, dental, sanitary engineer, and pharmacist officers, nurses, specialists, and other technical and non-technical employees on June 30, 1930—consisted of 1476 medical officers and persons of other scientific ratings and 3416 general and technical employees.

The Ransdell Bill has become law by the signature of the President, after receiving the approval of Congress. Under it the hygienic laboratory is made the nucleus of the new establishment, the National Institute of Health, which will be devoted to the purpose of inquiring into all phases for the prevention and cure of diseases.

According to Peter Valaer more than 16,000 persons were poisoned in the United States by drinking a ginger beverage containing tri-ortho cresyl phosphate and di-ethylene glycol. Quite a number of deaths resulted but in most of the poisonings paralysis followed.

Coöperating with the United States Department of Commerce, a Committee of national associations will make a survey of drug stores in St. Louis which is designed to provide correlated information about the merchandising coöperations of retail drug stores in its various phases. This fact-finding study of drug store merchandising will be carried on in a similar way as the survey of the Louisville Grocery survey.

In commenting on the business of 1930, President H. Sheridan Baketel, of the American Pharmaceutical Manufacturers' Association, said that pharmacists of the United States have pursued the even tenor of their way, kept their faces strictly in front, and have served in the same splendid manner which has always been so characteristic.

The election of officers of the AMERICAN PHARMACEUTICAL ASSOCIATION for 1930–1931 resulted as follows: *President,* Walter D. Adams, Forney, Texas; *First Vice-President,* J. G. Beard, Chapel Hill, N. C.; *Second Vice-President,* J. W. Dargavel, Minneapolis; *Members of the Council,* H. A. B. Dunning, Baltimore; S. L. Hilton, Washington; Ambrose Hunsberger, Philadelphia.

The winner of the Fairchild Scholarship for 1930 is Solomon Gershon, graduate of the University of Illinois School of Pharmacy. Thirty-seven students contested for the prize. The scholarship was established by Samuel W. Fairchild of New York City.

The Association of American Soap and Glycerin Products sent Crown Prince Gustaf Adolf, honorary member of the early Academy of Science of Sweden, a congratulatory message because of his country's part in the development of glycerol products—1930 marks the Sesquicentennial of Scheele's discovery of glycerin. Scheele was a pharmacist throughout life, from his early manhood.

The International Pharmaceutical Federation, in which the AMERICAN PHARMACEUTICAL ASSOCIATION holds membership, held its meeting this year in Stockholm beginning July 16th.

Arrangements are being made for the Washington Bicentennial, which brings to mind the fact that Apothecary General Andrew Craigie had a large part in the supply of medicines for the American Army and that General Hugh Mercer, Washington's friend, owned and operated an apothecary shop in Fredericksburg, Va.

Steps have been taken by Americans, residing in France, to establish a Pasteur Memorial Library at the University of Strasbourg. Here Pasteur did much of his outstanding work and for a time he was member of the pharmaceutical faculty.

The three hundredth anniversary of the first recorded use of cinchona was celebrated at the Missouri Botanical Gardens, October 31st and November 1st. This anniversary coincides with the 110th anniversary of the separation of quinine by Caventou and Pelletier, the noted French pharmacists and the 50th anniversary of the discovery of *Plasmodium malariae* by the French pathologist Alfonse Laveran.

Prof. Anton Hogstad, Jr., has been named pharmacognosist of Missouri Botanical Gardens.

The Committee having in charge plans for the representation of Pharmacy at the Chicago World's Fair Centennial Celebration in 1933 met in Washington, December 11, 1930. It is contemplated to appoint a director who will give full-time attention to the preparation for the exhibit and proper functioning during the time of the exhibition.

The National Association of Retail Druggists held its annual meeting in Atlantic City September 15th–19th. The officers elected for the ensuing year are: *President*, Julius H. Riemenschneider in Chicago; *First Vice-President*, J. W. Dargavel, Minneapolis; *Second Vice-President*, W. M. Rheineck, Milwaukee; *Third Vice-President*, James T. Dumas, Foley, Ala.; *Secretary*, Samuel C. Henry; *Treasurer*, Charles Ellers.

Wisconsin Pharmaceutical Association and North Carolina Pharmaceutical Association celebrated their fiftieth anniversaries this year.

The Pharmacy Building of Purdue University was dedicated on May 20th. The principal address was made by Dr. Edward H. Kraus of the University of Michigan.

The School of Pharmacy Building of the University of Maryland was dedicated on May 10th. The principal address was made by Dr. Edward Kremers of the University of Wisconsin.

The Board of Trustees of Rutgers University authorized the erection of a $60,000 addition to the College of Pharmacy building.

The first floor of the Cleveland City Hospital has been equipped for the pharmacy of the hospital. Three registered pharmacists are employed, all of whom are graduates of pharmacy. The New Lake Side Hospital of Cleveland, which is part of the University Hospital group, will move into its new quarters about January first. Three registered pharmacists are employed.

A fund has been created by *Popular Science Monthly* from which it will award annually a prize of $10,000 accompanied by a gold medal to the American student who has been adjudged to have made in a preceding year the achievement in science of the greatest botanical value to the world. The purpose is to heighten the interest of American people in the achievements of the laboratory.

In the manufacture of pure pharmaceutical products the selective action of solvents (water and organic) is just as important a study to-day as it was fifty years ago. J. U. Lloyd's significant results in studies in pharmacy 50 years ago have been published in the JOURNAL A. PH. A., with comments by Wolfgang Ostwald and Walter Haller.

An article by Dr. H. V. Arny in the *Scientific Monthly* for June discusses "Light and Medicine." He refers to the reports of the Committee on Glass Standardization and the relation of glass to the preservation of pharmaceutical preparations. This article is concluded with a statement of the fact that light is clearly proved to be a destructive factor, and the work of the Committee is to discover in each case the appropriate stabilizer, that appropriate chemical, a trace of which may aid the medicament in resisting the untoward action of light rays.

Prof. and Mrs. C. H. LaWall presented an article to the AMERICAN PHARMACEUTICAL ASSOCIATION on O. Henry as pharmacist, in which many references are made to his experience in drug stores and to his familiarity with medicines.

The year 1930 has again brought some outstanding accomplishments in chemotherapy as a result of the untiring efforts of pharmacists, pharmaceutical chemists, pharmacologists and physicians.

A comprehensive report on the pharmacognosy, chemistry and pharmacology of Viburnum was presented by Dr. Heber W. Youngken to the Scientific Section of the AMERICAN PHARMACEUTICAL ASSOCIATION. This report provides an authentic reference to the subject and is the result of extended research.

Work on ergot in 1930 has demonstrated that the amines have no great practical importance. It has been shown that a great many of the injection preparations vary in potency, according to the reports of Thompson, McClosky, Barbella and others. The standardization methods

have been declared more or less unsatisfactory and that better methods of the valuation of the activity of ergot are desirable.

During 1930 further work has been done on Squill. Its action is comparable to that of digitalis, mainly slowing and strengthening the contraction of the heart. Squill, however, is said to cumulate less than digitalis and also that it has greater diuretic action, which makes it of special value in dropsical cases and nephritis.

What is said to be an interesting development in the year 1930 is reported in information relating to bismuth therapy, supplied in a series of articles published in the September, October and November issues of the Archives of Dermatology and Syphilology, by Prof. Hanzlik and his co-workers. Their investigations were supported by a grant from the Committee on Research in Syphillis, Inc. Briefly summarized, they found that water-soluble bismuth compounds are uniformly absorbed and are eliminated much more rapidly than other bismuth compounds.

Another 1930 accomplishment, because of its readily available calcium content, is said to be calcium gluconate which is an important remedy whenever calcium medication is indicated. It is more palatable than calcium chloride for oral administration and is said to be non-irritating when hypodermically or intramuscularly used. Gluconic acid and calcium gluconate were only laboratory curiosities, previously.

Professors Binz and Räth synthesized about 700 different iodine and arsenic pyridine compounds which they found to be low in toxicity. Under a grant of the Emanuel Libman Fellowship Fund, this work was carried out at the Staedtisches Krankenhaus in Altona, Germany; in the urologic service of the St. Hedwig Krankenhaus, Berlin; and later in the urologic service of Dr. Beer, the radiologic department of Dr. Jaches and the Chemical Laboratories of the Mount Sinai Hospital, New York.

Some of the contributions to the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION have been mentioned in this summary of events; quite a number have been printed in the JOURNAL A. PH. A. and a greater number, in abstracted form, in May and later numbers of the JOURNAL. Mention is made of the following: "The Extent and Use of Former Pharmacopœial Products," by Cook and Frank; "Phytochemical Study of Hydrastis," by Langenhan and Gillis; "The Volatile Oils from the Leaves of Pacific Coast Conifers;" "Studies of the Deterioration and Stabilizing of Pharmaceuticals."

A research fellowship has been established in the School of Pharmacy, University of Maryland, by H. A. B. Dunning.

Research fellowships, supported by industry, have been reported; among them the AMERICAN PHARMACEUTICAL ASSOCIATION is mentioned in connection with Glass Container Research Fellowship at Columbia University. Fritzsche Brothers Fellowship at Columbia University for research in perfume chemistry, and a fellowship at the University of Wisconsin for the study of volatile oils and related subjects.

Maltbie Chemical Co. fellowships for the study of creosote are maintained at the Philadelphia College of Pharmacy and Science and Princeton University.

Merck & Co. fellowship at Rutgers University for pharmaceutical problems of a fundamental nature and a fellowship at Princeton University in analytical chemistry.

Wm. S. Merrell Co. fellowship at the University of Cincinnati for research in biochemistry.

E. R. Squibb & Sons fellowship at the University of California for the study of oral hygiene; at the University of Minnesota for the study of arsenicals; at the University of Wisconsin for the study of nutritional problems; at Yale for the study of organic syntheses.

Upjohn Co. scholarship at Kalamazoo College for research in chemistry; at the University of Michigan for research in pharmacology and another for research in pharmacy.

Wm. R. Warner & Co. fellowship at Johns Hopkins for the study of chemistry.

Eli Lilly & Co. at the Philadelphia College of Pharmacy.

A graduate fellowship in pharmaceutical research.

J. K. Lilly has established two fellowships in Purdue University School of Pharmacy.

DEATHS.

The following list of deaths is not complete, in fact only a few of many who have directly or indirectly served pharmacy. Several pharmacists of other countries are included in the list.

Dr. William H. Nichols, Chairman of the Board of Allied Chemical and Dye Corporation,

and a former president and charter member of the American Chemical Society, died February 21st, aged 78 years.

Jokichi Takamine, Jr., son of the widely known Japanese chemist, died February 22nd.

Harry Beckwith Mason, for many years editor of the *Bulletin of Pharmacy*, died March 8th.

Dr. Tokichuro Niwa, professor emeritus of Imperial University of Tokyo, and vice-president of the Japan Pharmacists' Union, member of the Japanese Pharmacopœial Commission, died March 12th.

Albert Hawkins, editor of the *Pacific Drug Review*, died May 8th.

Harvey W. Wiley, a former president of the U. S. Pharmacopœial Convention, for thirty years connected with the Bureau of Chemistry, died June 30th.

Stephen G. Porter, congressman from Pennsylvania, for many years active in antinarcotic legislation, died June 27th.

Dr. W. H. Henshaw, former chief of the Biological Survey, U. S. Department of Agriculture, died August 1st, aged 80 years.

William Arthur Frost, honorary president of the A. PH. A., 1825–1926, active in the formation and a charter member of the Minnesota State Pharmaceutical Association, active in securing Minnesota's pharmacy law and College of Pharmacy, died August 12th, aged 76 years.

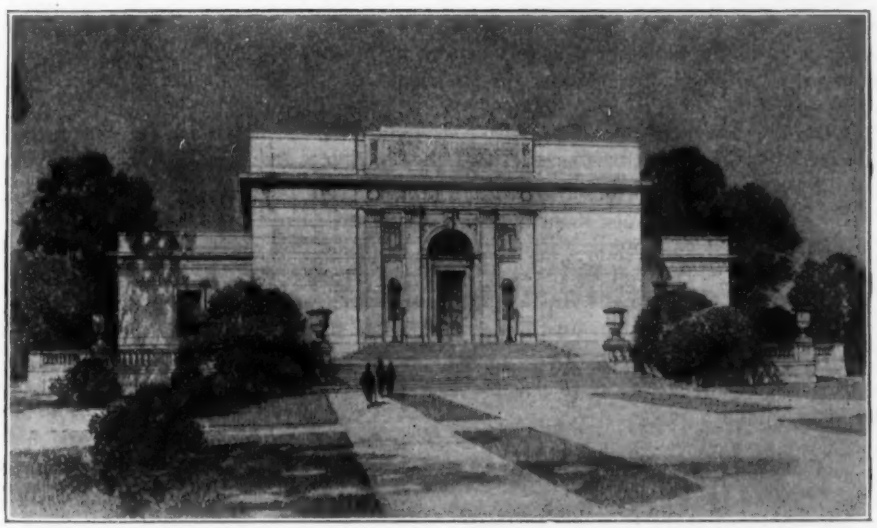
Edward Morell Holmes, honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION, noted botanist and pharmacognosist and an authority in other branches of science, curator of the museum of the Pharmaceutical Society for 50 years, died September 10th, aged 87 years.

George S. Davis, an incorporator of Parke, Davis & Co. died October 1st, aged 85 years.

George R. Merrell, former president of the St. Louis College of Pharmacy, an active figure in the National Wholesale Druggists' Association for many years, died October 2nd.

William Mittelbach, treasurer of the Missouri Pharmaceutical Association for 33 years, a former vice-president of the AMERICAN PHARMACEUTICAL ASSOCIATION, died October 14th.

Dr. Adolf Engler, internationally known botanist, died in Berlin, October 10th, aged 86 years.



ARCHITECT'S SKETCH OF PHARMACY HEADQUARTERS BUILDING—THE AMERICAN INSTITUTE OF PHARMACY—TO BE ERECTED NEXT YEAR IN WASHINGTON.

Do Your Part by Seeing That Pharmacy Receives Publicity in Your Local Press.

Left Cramer's Pharmacy at Paderborn where Sertuerner discovered morphine in 1803; Center, Friedrich Wilhelm Adam Sertuerner, 1783 to 1841; Right, present pharmacy at Einbeck, formerly Sertuerner's Pharmacy in 1809 to 1820.

REËSTABLISHED USE OF CINCHONA.*

It is now pretty generally agreed that the bark is the remedy we can most certainly rely on for the cure of intermittent fevers. I am disposed to think that Dr. Sydenham was the true restorer of the use of the Peruvian bark and in such doses as infallibly established its reputation. When I speak of the reputation of the bark being established I mean with respect to the opinion and practice of the leading physicians of the age. It is well known that at that time and even to the present day many of the inferior physicians and some of the vulgar have used the bark as a subject wherewith to humor their exclamatory smatterings. These, however, may be safely passed over, as no more affecting our general history than influencing the opinions of candid posterity.

When the justly celebrated Mr. Dryden wrote the following lines he was addressing himself to a bachelor, who, he knew, was, or affected to be, equally averse to a physician and a wife:

"The tree of knowledge first in Eden plac'd
Was easy found, but was forbid the taste.
Oh! had our grandsire walk'd without his wife,
He soon had sought the better plant of life.
Now both are lost; yet, wandering in the dark,
Physicians for the tree have found the *bark*."

"Everything singularly useful to mankind has, at different periods, acquired different appellations, according to the grateful enthusiasm of the vulgar, the learning of the historian, or the fancy of the bard."

U. S. PUBLIC HEALTH PERSONNEL.

The personnel of the U. S. Public Health Service, consisting of a corps of medical, dental, sanitary engineer, and pharmacist officers, nurses, specialists, and other technical and non-technical employees on June 30, 1930, consisted of 1476 medical officers and persons of other scientific ratings and 3416 general and technical employees.

*From: "Experiments on the Red and Quill Peruvian Bark; with Observations on Its History, Mode of Operation and Uses." Being a dissertation which gained the first prize given by the Harvein Society of Edinburgh for the year 1784. By Ralph Irving.—From program of Tercentenary Celebration, Missouri Botanical Garden.

PARACELSUS.

The photo of Paracelsus is from a portrait which hangs in the Louvre, Paris. It is by Scoral, who lived 1475–1562 so it is not unlikely that it is a portrait of Paracelsus and not a conception.

Philippus Aurelius Theophrastus Bombastus von Hohenheim passed his last years in Salzburg and died there in 1541. The house in which he lived, No. 3 Platzl, not far from the river, is still an apothecary shop, and over the entrance, on the wall, is a portrait of Paracelsus; a marble plaque has also been affixed to the house, just below the portrait. See page 288, March JOURNAL, A. PH. A., 1930.

LEGAL RECOGNITION OF THE BELGIAN "NATIONALE CODEX" SCHEME.

Belgian pharmacists have built up a unique professional organization under the name Federa. It is a federation of a number of undertakings which between them furnish the pharmacist with the advantages of legal defence, joint political or professional action, "third-party" and similar insurance, life assurance, sickness benefits and coöperative buying and manufacturing. One of the constituent organizations is the "Nationale Codex," which bears a close resemblance to the pharmaceutical Kontrole Laboratorium at Stockholm. By agreement with the makers, proprietary medicines and packed drugs generally are analyzed for comparison with the formulas declared on the labels and with the tests receive the approval of the Nationale Codex, and the manufacturers are supplied with Codex stamps to affix to each container. The pharmacist who sells a stamped packet is guaranteed indemnification in the event of any action being brought against him under the equivalent of the Food and Drugs Act. The Codex stamp represents in fact a form of warranty furnished by a laboratory maintained by the Belgian pharmacists as a body. The validity of the Nationale Codex scheme and the authority of the Codex stamp have received legal sanction by a recent decision of the Tribunal Correctionel of Brussels. The proprietary manufacturers who participate in the Codex scheme join in the satisfaction felt by the pharmacists of Belgium at the outcome of this case. The legal recognition now accorded to the Nationale Codex scheme will undoubtedly serve to confirm it in its position as a coöperative organization of makers and sellers of proprietary medicines so designed as to secure the sale of them with the greatest measure of protection to the public at large.—Through *Pharmaceutical Journal and Pharmacist.*

RINGWORM OF THE FEET.

Statements in this article are virtually all taken from a bulletin written by Dr. Robert T. Legge, professor of hygiene, University of California, who, with his associates, has made an extensive study of fungus diseases.

D'hobe itch, or Shanghai foot, was the cause of much suffering and disability among the U. S. Volunteers in the Philippines during the Spanish-American War and Philippine rebellion. Upon their return in 1899 to 1903, dissemination of the disease began, and it is now the most common fungus disease in America.

It is known under various names: "gymnasium foot," "athletes' foot," "ringworm of the feet," etc., and is widespread among workers in bathrooms and gymnasiums, among students and frequenters of public swimming pools and the users of common shower baths in hotels and clubs.

The principal fungus responsible for ringworm of the feet is *Tricophyton interdigitalis.* It will grow readily in human skin or hair or in any tissue, animal in character, such as wool, silk, bone, horn or leather. It multiplies and continues to keep up infection by the countless skin scales and hairs that are cast off the body during the process of dis-

robing or taking a bath; the next bather transfers the organisms to his own feet.

Bits of infected skin may be soaked in alcohol and the bacteria and mycelium destroyed, but when the particle of skin is washed and placed in a suitable culture medium, mycelium will again appear in a few days, definitely proving that the spores are deeply imbedded in the tissue and demonstrating the uselessness of many ointments and lotions now used as treatment.

Treatment: No specific treatment has been discovered, but iodine in glycerin, or thymol 1 or 2 per cent, have been found very efficient. Salicylic, benzoic and sulphurous acids are also used. Dr. Legge also recommends crystol, one of the dyes.

One per cent thymol when dissolved in alcohol or gasoline and poured into the shoes and allowed to drain and dry seems very effective as a disinfectant.

Bichloride of Mercury, 0.1 in 1000, will kill spores of *tricophyton* in three minutes and could be added to a floor-cleaning compound as an effective and economical fungicide for use in hotels and clubs, or in runways to showers and swimming pools. *Army Bulletin* No. 23 recommends for this purpose a daily scrubbing with a strong solution of calcium hypochlorite.

Precautions: Never place the bare feet upon the floors or shower baths in public places.

Gymnasium clothing should be of cotton or linen. Cotton socks should be used; woolen socks favor the growth of fungi.

When bathing in gymnasiums, pools or showers wear rubber bathing slippers. When using a public shower and slippers are not available, step on heavy newspaper or towel when bathing, and likewise when drying the feet.

When drying the body with a towel always dry the body before using the towel on the feet.—Through *Ohio Health News*, November 15, 1930.

HAIR WASH CONTAINING CHOLESTERIN.

Such hair washes are best prepared with the aid of anhydrous lanolin, for the reason that this substance contains a large amount of cholesterin. The preparation is carried out in a manner similar to that of lanolin milk, and as much water as possible is added to the mixture without disturbing the emulsion. When the proper care is taken, this offers no great difficulties. Thus ten parts by weight of anhydrous lanolin are mixed with twenty parts by weight of water and then half a part by weight of soap dissolved in twenty parts by weight of distilled water are added. This mixture is thoroughly triturated in a mortar and then from two hundred to two hundred and fifty parts by weight of warm water and 5 cc. of tincture of benzoin are gradually added.

In another formula fifty parts by weight of anhydrous lanolin are mixed with twenty-five parts by weight of coconut oil, the same proportion of soap powder—eight parts by weight of powdered borax and eighty parts by weight of water, and the mixture is heated. The mixture is triturated in a motor. Then a mixture of four hundred parts by weight of rose water, the same proportion of orange flower water, 0.2 part by weight of oil of bergamot and the same proportion of tincture of musk are added in small quantities at a time while the mixture is being continuously triturated. Still another formula calls for the solution of one part by weight of cholesterin in 98 parts by weight of 90 per cent alcohol and the addition of half a part by weight of castor oil as well as the same proportion of heliotropin.—*Med. u. Pharm. Rundschau*, through *Drug Markets*, September.

PERSONAL AND NEWS ITEMS.

Dr. Edward Kremers gave two lectures at the University of Michigan, November 12th—the first on "The Apothecary in Literature," and the second, on "Life of Justus von Liebig."

Dr. Chauncey D. Leake has been appointed lecturer in pharmacology at the College of Pharmacy, University of California.

J. Leon Lascoff has a permanent pharmacy display in his pharmacy; this includes apparatus used in preparing galenicals, dispensing capsules, wafers, tablets, etc. Also, apparatus of historical interest and reference books.

Dean C. C. Bass has announced that the Board of Administrators of the Tulane University of Louisiana has decided to indefinitely suspend the School of Pharmacy, effective with the close of the session 1930–1931 and the graduation of the last class who will receive the degree of Graduate in Pharmacy.

Doctor T. B. Magath, of the Mayo Clinic, has accepted appointment as editor-in-chief of the new official journal of the American Society of Clinical Pathologists to be known as the *Ameri-*

can Journal of Clinical Pathology, of which the first number will be issued in January 1931.

The new journal will emphasize new methods in laboratory work, the material being primarily of a practical and clinical nature. It is designed to be useful and serviceable to the technician as well as to the pathologist. For the present the journal will be published bimonthly.

R. B. Murray will be manager of the new plant of Mallinckrodt Chemical Works, Ltd., in Toronto. **Leo G. Ryan,** a former retail pharmacist and president of Montreal College of Pharmacy has charge of the Montreal headquarters.

Henry S. Johnson has been elected dean of Connecticut College of Pharmacy. He was for a time professor of Organic Chemistry at the University of Porto Rico. He received his Master's degree at Yale Graduate School and holds a Captain's commission in the Officers Reserve Corps, Chemical Warfare Service.

The Alumni Association of Columbia University College of Pharmacy will tender a testimonial dinner to **H. V. Arny,** newly appointed dean of the college, on the evening of February 25th at the Hotel New Yorker. The preliminary arrangements were made recently at a committee meeting during which many members of other pharmaceutical organizations offered their hearty coöperation. It is therefore expected that the banquet will result in a general turn-out of all the friends and admirers of Dean Arny and be a real tribute to him.

Frederick Rohnert, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, prominent pharmacist of Detroit, Mich, is celebrating fifty years in pharmacy.

A. M. Lichtenstein, of Cumberland, Md., has donated an Indian mortar to the ASSOCIATION. Evidently, the mortar dates back a long time—it is made of clay and while, in proportion, it follows the usual lines, the surface, both the inside and outside, are rough. One handle is twice the length of the other, this, and part of the roughness, may have resulted from usage. We are indebted to the donor and hope others will think of the library and museum, soon to be a reality, when they have items of interest—if possible, the history of the article should be given.

NEW HAMPSHIRE AND VERMONT ASSOCIATIONS.

The New Hampshire Pharmaceutical Association will hold its mid-winter meeting in Concordia, in January. It is contemplated to hold the annual meeting in the White Mountains some time in June.

Vermont Pharmaceutical Association will meet at Lake Money Club, Fairlee, June 15th and 16th.

BOOK NOTICES AND REVIEWS.

Inorganic Pharmaceutical Chemistry. By CHARLES H. ROGERS, D.Sc. (in Pharmacy), Professor of Pharmaceutical Chemistry in the College of Pharmacy, University of Minnesota. Published by Lea and Febiger, Philadelphia. 676 pages with 50 engravings. Cloth $7.00.

The text of this book was written for the purpose of filling a distinct need for a chemistry which would offer pharmacists and students of pharmacy a specialized study of the inorganic chemicals of particular pharmaceutical interest.

The author has assumed in presenting his material that the readers are familiar with the fundamental laws and theories governing the activities of chemical bodies; that they will have previously learned in courses of general chemistry certain characteristics of the elements.

Presupposing, therefore, this general knowledge theoretical discussions of ionization, equilibrium, electrolysis, etc., are abandoned in favor of a precise delineation of facts regarding those elements and compounds which are of importance in pharmacy. The subject matter begins immediately with a study of oxygen and ozone, omitting the usual preliminary chapters on the physics of matter and other theoretical considerations.

It will be seen then, that as there is no theory whatsoever presented the book is not a substitute for one on general chemistry, rather an addition to, or a supplementary reference which contains information only about chemicals used in pharmacy.

The elements studied are, with few exceptions, taken up in the order they occur in natural groups or families. There are, in consequence, eleven major divisions of the book, each of which is sub-divided into three to six chapters. In brief, the outline of the contents is as follows: Chapters I–IV, inclusive, cover oxygen, ozone, hydrogen, water, hydrogen peroxide, nitrogen, nitrous oxide

and ammonia. The halogen family is next, comprising a section of five chapters, in which is also included a study of inorganic acids. The alkali metals, coinage metals (copper, silver and gold), alkaline earths, beryllium and magnesium and their compounds; boron, together with aluminum and the metals of Group III, Group IV; the phosphorus family; Group VI, and a section covering iron, cobalt and nickel follow, as the other main divisions of subject matter in the sequence listed.

The plan of the various chapters is a uniform one. First, the element to which the chapter is devoted is studied. Then each of its official and pharmaceutically important compounds are discussed. The material involved is set forth consecutively under the heads history, occurrence, physical properties, chemical properties, tests for identity, commercial methods for manufacture (considerably elaborated), laboratory methods of manufacture, quantitative determination, pharmaceutical preparations and uses. Where the author has deemed advisable the pharmacological action of the various ions have been inserted.

Viewed as a compilation of facts regarding the chemical tools of pharmacy the book has adequately fulfilled its destiny, although possibly a little too much weight has been placed on methods of manufacture, and not enough on the reactions of the chemicals. It does represent an advance in its field and points the way to standardization of such material. Perhaps it will aid in restricting the number of definitions of pharmaceutical chemistry, thus making the work taught under that name more uniform and rendering thereby a service of great value.—LOUIS WAIT RISING.

Recent Advances in Analytical Chemistry. By C. AINSWORTH MITCHELL. Publishers, P. Blakiston's Son & Co., Inc., Philadelphia. Price $3.50.

Volume I of "Recent Advances in Analytical Chemistry," covering certain important analytical methods of organic compounds and edited by C. Ainsworth Mitchell, makes a definite contribution to the field of analytical chemistry.

The fact that each of its ten chapters has been written by a person with very special knowledge of the subject he is treating, makes it presumptuous for any one person to pretend to pass critical judgment on the details of the many different methods presented.

Rarely has an author succeeded in doing more exactly that which is stated in the preface as his purpose. The object of the work according to the editor is to present a brief summary of the older analytical methods for the subjects treated, together with ample literature and abstract references. The more recently developed methods are presented in considerable detail. Some of his suggestions as to fields of research, looking toward further development of analytical methods, seem very promising.

The subjects treated in separate chapters are Sugar Analysis, Oils and Fats, Essential Oils, the Proteins, Tannins, Cereals, Milk and Milk Products, Paper, Petroleum, Coal and Gas Analysis. The analytical methods used for these substances are summarized and brought up-to-date.

The Editor is correct when he states that the volume cannot replace but merely supplement more comprehensive standard works such as "Allen's Organic Analysis" and other more restricted volumes. He is very modest, however, when he states, "The work is primarily intended for those who have a general knowledge of chemistry but require information as to the best methods of dealing with analytical problems on the various fields discussed." It is a book which can be used to advantage by even the most experienced analyst.—ERNEST LITTLE.

Ergänzungsbuch zum Deutschen Arzneibuch (Supplement to the German Pharmacopœia). Compiled and published by the German Apothecaries Society. 5th Edition. The book is to be obtained from Verlag des Deutschen Apotheker Vereins and the price is 10 marks.

The statement is made on the title page that the drugs and preparations in this book are not official in the German Pharmacopœia. A description in brief of this work might be given as a composite of the "National Formulary," the "New and Non-official Remedies," and the "Pharmaceutical Recipe Book."

Among co-workers on the book the following are named: Dr. J. Herzog, Prof. Dr. H. Zörnig, Dr. K. Schulze, Dr. F. Diepenhrock and the late Dr. L. Lewin.

About 1000 articles are considered in the book of more than 500 pages. In connection with drugs for which standards are included there are also suggestions relative to their preservation, and the characteristics of the preparations; color, taste, etc., are briefly

described. Maximum single doses are given and also the dosage for a day. Each monograph has a Latin heading and also the German name of the drug and preparation. In most instances the name of the chemical is followed by its chemical formula, molecular weight and the percentage amount of the important constituent; the arrangement is alphabetical. The book also contains a number of tables, comprising doses, poisons, a schedule of items that should be protected against light or other influences, a list of synonyms, and a comprehensive index. While the book has been prepared for German pharmacists, it will be found useful in American pharmacies, especially in those compounding foreign prescriptions.

The book is well bound and printed and serves a useful purpose.

Anleitung zur mediznisch-chemischen untersuchungen fuer Apotheker (Introduction to clinico-chemical testing by pharmacists). By DR. PH. HORKEIMER. Verlag von Julius Springer, Berlin, 1930. 81 text pages, 16 illustrations. Price 6 marks.

The small book describes the clinico-chemical tests on which the pharmacist of the present day should be informed and qualified to apply. The author has given the methods which he has found useful in his practice, but advises that experience is required and also that with the development of this work other reference books will be needed. The text has been prepared in a way that will be understood and enable the pharmacist to apply the tests.

The greater part of the book deals with urinalysis in its various phases; first the method of collecting the sample of urine is explained and then the physical characteristics—the color, transparency, specific gravity, reaction and optical rotation. The following pages describe tests for albumin, sugar, acetone bodies, bile, coloring matters, indican, ammonia, urea, uric acid, total nitrogen, chlorides, etc. Next, the urinary sediments receive consideration, and the illustrations—photographic reproductions—show various urinary sediments. Other portions of the booklet deal with examination of the blood, stomach contents and bowel contents.

The Calendar of the Pharmaceutical Society of Great Britain, 1930–1931, published by the Society, 17 Bloomsbury Square, London, W. C. 1, England. Price 3s. 6d. The Calendar contains important data of the British Pharmaceutical Society—officers and committees of the Society, also the names of the Committee for Revision of the "British Pharmaceutical Codex."

The opening pages give a history of the British Pharmaceutical Society, its pharmacy school and other activities, also a list of the funds, scholarships and prizes. A chronological record of former presidents, vice-presidents and treasurers since the foundation of the Society is included, and the honorary members and corresponding members of the Society are named. The Calendar contains its constitution and by-laws, a list of the British schools and colleges of pharmacy; a general outline of the examinations, and questions of several scholarship examinations are reprinted, and also of those for prize competition, with an alphabetical list of prize winners. The remainder of the book is given over to British pharmacy laws, their enforcement, etc.

The Calendar is of prime importance for British pharmacists and has value for those of other countries, particularly, for board of pharmacy and faculty members.

Formulaire des Medicaments Nouveaux for 1930, 35th Edition, compiled by Dr. R. WEITZ, member of the Faculty of Pharmacy, Paris, and pharmacist at the Paris dispensary. The preface has been written by PROF. PAUL CARNOT of the Faculty of Medicine, Paris. Published by J. B. Bailliere and Sons, 19 rue Hautefeuille, Paris, France. Price 32 francs, in paper binding.

Prior editions of this Formulary have been reviewed in the JOURNAL. In the preparation of this book the officials of the French Codex have not been included. The preparations are described in monographs and more attention has been given to the therapeutics than in other publications of this kind. While of first importance to the French pharmacist, the Formulary is of value in all pharmacies where foreign prescriptions are filled. Both official and trade names are given of chemicals, description and their dosage. An index of 60 pages speaks for the number of items which have received consideration in this Formulary. The concluding pages of the book contain an alphabetical list of pharmaceutical specialities, together with the names of the manufacturers.

Fabrikations Methoden für Galenische Arzneimittel und Arzneiformen (Manufacturing methods for galenicals and other forms of medication) by JOSEF WEICHHERZ and JULIUS

SCHRÖDER, published by Julius Springer, Vienna, Schottengasse 4, price RM 28.50.

The authors of this book have made an effort, and quite successfully so, of presenting a book on the manufacture of galenicals and other forms of medication; the processes are for large quantities; however, there is information of value to be derived from the book for the retail pharmacist. Articles have appeared in pharmaceutical publications on the manufacture of various forms of medication, but as far as the writer knows the subject of pharmaceutical manufacturing has not heretofore been treated very extensively and presented in book form. The authors have given their experience in manufacturing; they explain that the manufacturing in a small way and on a large scale differs materially and not infrequently the appearance of the resulting products is not the same; in a few instances manufacturing in small quantities has advantages over the processes requiring machinery.

The book is well illustrated, having nearly 350 illustrations; to a certain extent, the selections have been made with a view of explaining the principles of machinery construction, and the claims of the respective manufacturers for the machine or its product. The authors do not contend that the book is complete as to all the essentials of manufacturing, for there are things that can only be learned from experience. The book has eighteen chapters and most of them are subdivided. The first chapter deals with comminution and powders. It would seem that the latter might well be treated in a separate chapter or a sub-division, but the authors consider the subject of comminution and then discuss the formulas and preparation of powders. The latter are quite varied—dusting, shampoo and tooth powder; Dover's, Seidlitz, compound licorice powder, etc. The second chapter is entitled, "Die Körner (granulata);" granulation also enters into the subjects of a number of succeeding chapters; and granules receive consideration in another chapter; in that now under discussion—granulated forms—both effervescent and non-effervescent granulations are included. The next chapter deals with pastilles and lozenges; then follows the one on tablets, covering 34 pages dealing with the preparation of the powder or granulation, the machines, the manufacture; tablet triturates.

Solutions are next considered and the subject is part of other chapters; then follow tinctures, extracts and fluidextracts. The chapter on emulsions is quite comprehensive, dealing with various emulsions and methods that may be employed in their preparation. These are followed by salves, ointments, cerates, plasters, giving information relative to their manufacture and description of the apparatus and machinery employed. A chapter on the manufacture of suppositories follows; next, two chapters on foods for infants and invalids, confections, etc. Twenty pages are devoted to coatings of pills, tablets, granules, etc. Twenty-five pages deal with ampuls, their manufacture, cleansing, filling, sealing, etc.; gelatin capsules also receive consideration and a final chapter deals with the packaging of the various forms of medication.

The illustrations are good, and while the book has greatest value for the manufacturer there are many points which can be utilized by the retail pharmacist, as has already been stated.

(*To be continued*)

EDWARD SWALLOW.

We are advised of the death of Edward Swallow, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, correspondent of British pharmaceutical publications. Mr. Swallow was intensely interested in creating an official flag for pharmacy.

The deceased was born at Lurrey, England, February 5, 1860. He served as an apothecary in London until 1896, when he settled in New York City. For a number of years Mr. Swallow did detail work among physicians and, later, he became associated with C. O. Bigelow, and from 1910 until 1922 he was apothecary in Bellevue Hospital. In later years Mr. Swallow gave all of his time to journalistic work. The deceased is survived by his widow, to whom sympathy is expressed.

We have word of the passing of several of our members. The information came too late for due mention in the JOURNAL.

Cyrus B. Warne, Redfield, S. Dak.; Prof. Maurice A. Miner, Chicago, Ill.; F. C. Waterbury, Des Moines, Ia.; B. L. Murray, Rahway, N. J.

Dr. Fritz Pregl, 61, winner of the 1923 Nobel prize in chemistry, died December 13th, at his home in Vienna. He won the Nobel award for the development of an antiseptic iodine solution which bears his name.

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(Continued on page xii)

The 1931 A. Ph. A. meeting will be held in Columbus Hotel, Miami, Fla., during the week of July 28th.
***Local Secretary*, G. H. Grommet, 2364 S.W. 11th St., Miami.**

A FEW OF MANY COMMENTS ON THE PHARMACEUTICAL RECIPE BOOK.

The AMERICAN PHARMACEUTICAL ASSOCIATION desires to thank the publications for the consideration given in their respective reviews. It is not possible to quote from all the comments made, and no particular selection has been made in the following; it was realized that a few abstracts would fill a page. Other reviews are just as favorable and, as stated, all are thanked for the consideration given.

American Journal of Pharmacy.—"The long heralded Recipe Book of the AMERICAN PHARMACEUTICAL ASSOCIATION is at last available. For a great many years various workers have contributed their efforts in the compilation of the valuable collection of formulas and finally these recipes have been gathered together, classified, standardized and tested as to workability and reliability—and now comes the finished book, a well-printed, durably bound, blue book of practical formulas. No longer need druggist Brown be thinking that Benedict Solution is like benedictine, a cocktail ingredient or that Mittendorf's spirit is an eye opener (which it really is—Spiritus Ophthalmicus Mittendorfi). Such formulas he will have at hand for here is a book that represents an effort to compile all the practical and the called for pharmaceutical and near pharmaceutical recipes."

Canadian Pharmaceutical Journal.—"The book (The Pharmaceutical Recipe Book) contains practical working formulas suitable for the pharmacist who wishes to prepare any of these products. Since this book lists formulas for many preparations not readily found in the literature and since it will continue to standardize these it should prove to be a very valuable source of practical information to every pharmacist."

Journal of the American Dental Association.—"This (The Pharmaceutical Recipe Book) is a book of 454 pages containing medical recipes of every imaginable variety. Naturally the ones of greatest interest to the dentist are those on dental formulas. These consist of dental creams, pastes, powders, mouth washes of all kinds, dentifrices, dental waxes, and fillers, tooth-ache drops, tooth-ache paint, tooth-ache wax, etc. Altogether there are thirty-four recipes which might appeal to dentists and it is assuredly a convenient medium of reference to have this book at hand for immediate use at any moment."

The National Druggist.—"In this book (Pharmaceutical Recipe Book) the AMERICAN PHARMACEUTICAL ASSOCIATION has called and made accessible to practicing pharmacists a large number of formulas of unofficial preparations that are quite frequently used. The formulas are assembled in sections each covering a more-or-less distinct field. Each section is alphabetically arranged according to English names."

Drug Markets.—"Publication of the Recipe Book makes available to the dispensing pharmacist and manufacturing pharmacist an authoritative source of formulas for preparations which are in demand but are not ordinarily found described in any other formulary or recipe book. It is for this reason that the Recipe Book will supply the important need of the average pharmacist, laboratory worker and manufacturer. It is believed that the book will fulfill the aims of the ASSOCIATION in furnishing definite formulas for preparations in fairly common demand, but which are not included in the official standards. The style and typography of the book closely resemble that of the Fifth Edition of the National Formulary. The book can be recommended for the laboratory and the library of every dispensing and manufacturing pharmacist."

Apotheker Zeitung.—The essence of the statement is: The Pharmaceutical Recipe Book will find a useful place in the library of every pharmacist. The review outlines the arrangement and contents of the volume and commends it as above indicated.

The Druggists Circular.—"The Recipe Book is a marked credit to the Committees who compiled the formulas, to the Chairman and Editor and to the ASSOCIATION who published it. Eventually it will find its place among the most valued hand books of the profession. There is a place for it on the prescription counter of every retail drug store in the country."

Pharmaceutical Era.—"The publication of this volume (The Pharmaceutical Recipe Book) makes available to the practicing pharmacist an authoritative source of formulas ,particularly many special formulas for preparations which the druggist is called upon to make that are not ordinarily found assembled in any other formulary or recipe book. In this respect the Recipe Book will supply an important need of the average druggist and we believe will fulfill the aims of the ASSOCIATION in furnishing definite formulas for these preparations outside of the official books that are in fairly common demand in the retail pharmacy and in the hospital pharmacy."

Practical Druggist.—"This first edition of the Recipe Book represents the outcome of an effort of the AMERICAN PHARMACEUTICAL ASSOCIATION to place in the hands of the pharmacist a reliable and comprehensive book of recipes applicable to his business. From an examination of its contents we feel confident that the book will assume the same serviceable position that the National Formulary has obtained in its particular field. Besides the 777 pharmaceutical formulas there are 375 hospital formulas from the leading hospitals of this country and Europe. There are 66 diagnostic reagents and clinical tests; 69 technical; 184 affiliated formulas, not to mention an extensive list of dental, veterinary and photographic formulas. The Pharmaceutical Recipe Book will be found invaluable by pharmacists and reflects great credit on the Committees to compile the formulas with discrimination, to the Chairman, the Editor and the Publication Committee of the ASSOCIATION."

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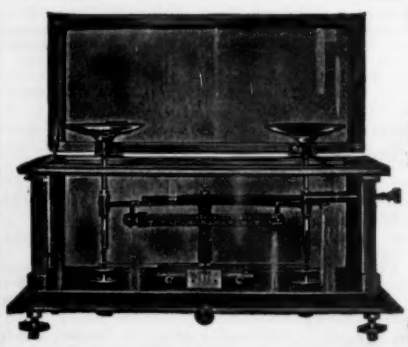

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